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Southern Flight

The only complete monthly digest of aeronautics in the South and Southwest

MAY, 1942 VOL. XVII, NO. 5

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REVVING UP

Below the Belt

Time magazine prides itself in being "curt, clear, complete". Often curt, **Time** is rarely complete, especially when they have a bone to pick and apparently would rather leave a lot to the reader's imagination than to report facts. In their attempt to be clever, **Time's** editors often prefer insinuations to meaty news. This practice has been noticeable to us over the years, especially in **Time's** coverage of aviation topics.

A typical case of **Time's** sloppy reporting on an aviation story can be found on page 88 in the issue of April 13 under the heading of "War Baby", covering the recent War Department contract award to Texas' Globe Aircraft Corporation of Fort Worth.

The Weekly Newsmagazine would have us believe, by clever insinuation, that Globe's contract might have been negotiated through politics. They observe with interest that North Carolina's Senator Bob Reynolds, chairman of the Senate Military Affairs Committee, before which come all Army appropriation bills, happens to be a brother-in-law of Globe stockholder John R. McLean.

To **Time**, Globe "is one of the most astonishing war babies of World War II." But Globe is neither a war baby nor astonishing. It is simply a young aircraft company, born before the war broke out, with alert business management (John Kennedy, oilman George Hill, et al.) and a capable, time-tested airplane production man (E. J. "Jim" Rivers, who flew in the early days with General Billy Mitchell and built many a good airplane in the past twenty years).

If it's a crime to give a small company a contract to build warplanes, we had better shut down all of American industry and have one helluva good investigation. If it's questionable for the War Department to seek out management and production men to help build the 185,000 airplanes ordered by the President, we had better junk our present system and forget about winning the war.

Globe is to build a twin-engine plywood Beechcraft advanced trainer. Beech believes they will do a good job; so why should **Time** be so amazed?

Let cocky **Time** editors spend more of their time seeking out and encouraging new "war babies" like Globe Aircraft, rather than deliberately tearing down the confidence of the American people with copperhead copy based on cowardly inference, devoid of truth and honest reporting.

Another One for Dixie

Were it not for wartime censorship, all of Dixie would gather around to celebrate the construction of Bell Aircraft's new factory "somewhere in Georgia". We can't tell you where it is, how big it is, or what it will produce, but Dixie knows one thing: if Larry Bell, Woody Woodson and their able gang of engineers and production men are running the

(Continued on page 26)

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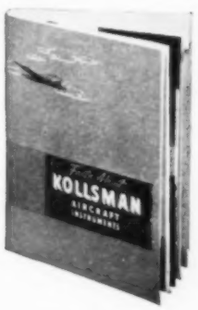

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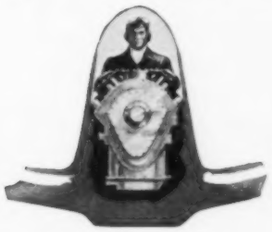


THAT'S an important specification for an airplane engine, when you want every mile of speed you can get from a military fighter plane.

When you cut down wind-resistance, you get more good from horsepower and fuel, because it's less effort to push the plane through the air.

And only with a liquid-cooled engine can you build such a plane.

So General Motors undertook the long job of developing the Allison engine—starting back in 1930.

And now that thousands of these engines have gone into service, America can be glad that someone tackled that job. They're going into planes for the U.S. Army and the R.A.F. And they've been meeting the test of combat everywhere — in the Far East, the Middle East, Europe and Africa —as you read in the newspapers from day to day.

Each succeeding month, in fact, adds to the evidence that the Allison engine is unsurpassed for the job assigned to it.

Curtiss P-40 (U.S.)
The British call it "The Tomahawk" or "The Kittyhawk"

The experience of General Motors is full-rounded and without bias in the airplane engine field. In addition to the liquid-cooled Allison engine, GM is under license to build air-cooled radial engines in its Buick and Chevrolet plants.

Bell Airacobra
U. S. and British designation

Lockheed P-38 Interceptor (U.S.)
The British call it "The Lightning"

North American Apache (U.S.)
The British call it "The Mustang"

LIQUID-COOLED AIRCRAFT ENGINES Allison DIVISION OF GM GENERAL MOTORS

The Birdmen's Perch

This month's Perch is being written in an unnamed town somewhere east of the Mississippi. We've not been recognized yet and if we can help it we're not going to be! Our Tattered Wing Tips are positively lacey at this point. Explanation below.

Major Al Williams, alias "Tattered Wing Tips,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

A GOOD FIVE-CENT SAGA

First time we have a chance we're going to sit down and write one of those jump-ahead-of-the-Gestapo books. It'll be a daisy, too. We have become a one-man persecuted minority.

For the benefit of the three (there couldn't have been more) lads who did NOT write nasty things to us about our mistake in the January Perch, it happened like this: We printed a Brain Twister in which Aviators 1 and 2 asked for half of each other's gas. The boys should have said "one gallon" instead of "half."

Well, sir, soon after the Twister appeared we began to get requests for the

answer. We mailed them out, chuckling like crazy at how we'd stumped all the smart Perch Pilots.

Then ZOWIE!—the mail began to zing into Pittsburgh in fighting vees. "Where did we ever get an answer like that; and who ever told us the puzzle *could* be worked; and what was the country coming to with such people as us on the loose?"

We checked back, found our mistake, pinned a letter of apology to our door for the mailman and got out of town fast!

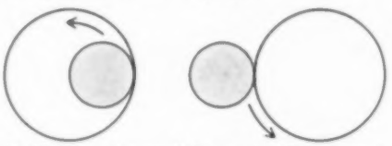
Wherever we go now, dogs snarl at us, children throw stones. No one will talk to us—not even our draft board. But worst of all is our treatment at the hands of flying men. We've skulked from one end of the country to the other trying to hide from pilots who leer at us and hiss, "STUPORMAN!"

Please, fellas, give us another chance.

If you do, we'll give you a lulu of a puzzle this month. We'll give you a puzzle that'll throw you into a flat spin in thirty seconds flat. (Anti-spinchutes barred.)

THIS MONTH'S BRAIN TWISTER

The diameter of the large gear is just twice that of the small one. How many revs will the small gear make in going round (A) the inside of the large gear (B) the outside of the large gear?



Ya' better give up right now and drop us a card for the answer. Our solution has been triple tested, double checked, and passed by a board of experts—this month!

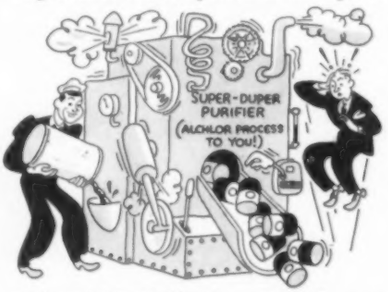
CENTIGRADE STUFF

A late model, twin-engine attack bomber has two 13-inch oil coolers which do the cooling job of an *18-ton refrigeration system!*

Mention that to someone outside of aeronautics and he'll probably tell you you're crazy. Tell it to a man in the industry and he'll simply shrug his shoulders and wait for you to continue.

We're trying to point out that superlatives have become commonplace in this business. We continually take for granted things which astonish non-flying men. Such as Gulfpride Oil—

Try explaining to one of your groundling friends the temperatures and speeds



under which Gulfpride must deliver an efficient job of lubrication.

Tell him that even though we used nothing but the finest crudes available, we had to develop a special refining technique, the Alchlor Process, to make a lube with Gulfpride's stamina. Make him understand that this Alchlor Process begins where ordinary refining methods leave off. It does a more *complete* job of purifying; gets *more* of the carbon makers and sludge formers out of Gulfpride. Tell him Gulfpride Oil costs about the same as other aviation lubricants.

Then grab your non-flying friend by the arm—he's apt to be sagging a little.

• • •

We're going to pass up the Whopper this month and see if we can't track down some of the Perch Pilots we've not heard from lately.

We wonder, for instance, if Mush Mathis is still a jump ahead of his CPTP classes and how E. H. Pickering's business (air freight) is, these days.

We've not heard from the Swinson brothers who operate a flying service in Pratt, Neb.,

nor from Dave Mayor, in many moons. And what about Foggy Davidson? If you fellows are out of ink, maybe a drop or two of Gulf Aviation Gas might help your pens take off.

Ground Instructor Walter Biddle was in Albuquerque when we last heard from him, but that was months ago. And Bob Secrist of Dayton and Richard Sullivan of Kansas City, what's happened to you lads?

Come on, gang, let us know what's happening. And send in some more Whoppers and Brain Twisters.

And *don't* forget the answers.

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CPTP operators everywhere know the importance of these features . . . appreciate the fact that *their* experience and *their* suggestions have been built into Waco trainers.

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LET'S GO! U.S.A. · KEEP 'EM FLYING!

WACO AIRPLANES

Just Among Ourselves

Good-bye, Mr. Goering!

"Bombers, Not Fighters, Win Air Superiority."—*Southern Flight, January, 1942.*

IT'S the little things that have forced us to conclude that Axis air power has reached its turning point and is waning. And little things — big in themselves but small in the size of global war — show the ascendancy of the United Nation's air strength.

All signs point to this:

Germany, Japan and Italy were not prepared to fight a world war over great distances, from the air power standpoint. Imitators from the start, they concentrated on tactics which could be most readily developed on the grand scale. They even copied errors. And they have and are now frittering away their air forces in improper employment.

Axis victories suddenly gained from brilliant exploitations of American innovations are turning sour because ingenuity is lacking to extend the influence of air power beyond the battlefield. Simultaneously United Nations staffs are just beginning to uncork air strategy which springs from year after year of constant trial and error experimentation begun soon after 1918. We have seen this strategy blossom forth over Tokyo and Japheld Philippine targets and we'll soon see it flower over Berlin and other German industrial centers.

While Hermann Goering dramatizes his monumental flop with still more debacles, America's Millard Harmon and Frank Andrews and its Breretons and Royces are just beginning to sparkle into brilliance.

Little things first revealed the inadequacy of German air planning when British industries, communications and air bases withstood the Luftwaffe's blitz after Dunkirk. Stubborn British defenses counted much, to be sure. But so did the German mistake of misusing its Stukas and heavier bombers. We call the dive-bombing assault on heavily-defended areas an error because Stukas were designed for battlefield aviation, in which they proved masterful. Long-range, high-flying heavy bombers are the only effective weapon against targets in the British Isles on which Britain's victory or defeat depends. And Germany's failure to wage its air offensive on this basis indicates (1) the absence of the proper equipment in sufficient force, or (2) inadequate evaluation of the problem.

Germany's air forces duplicated this failure in the Russian campaign, for the flow of materiel and supplies from inland centers was not decisively checked by air action. For what reason did the Nazis fail to air-blitz far-off Russian industries and bases during the winter stalemate? The only excuse we can find is that Goering was not prepared in heavy bombardment aviation, although he was up-to-the-minute in medium bombardment, battlefield aviation and fighter strength. When the land-locked panzers, stopped cold in more ways than one, were unable to shove German air bases farther and farther towards their goal, the air offensive bogged down with them.

The truth of the matter, as everyone knows, is that Germany emulated an American "original" when it exploited dive-bombing. Udet had studied Al Williams' stunts at air meets, German attaches had witnessed demonstrations by the old Third Attack Group (which we used to cover for the papers), and Navy techniques were copied faithfully by German tacticians. They also aped America's fighter plane developments, air transport and blind flying (in fact they stole the march on us in this last one!)

Why didn't they copy American heavy bombardment? The answer is that America hasn't had heavy bombardment for them to copy—not "in being," we mean. Four-motored Boeings were few and far between until recently, and hardly anyone outside of Frank Andrews and his followers thought a whole lot of those we did have. The British didn't even want them until late in the game!

All this was coming to a head during the period 1932-39, during which Germany began its air expansion with gliders and sailplanes and sought eagerly for experimentation in the Spanish theatre. Heavy bombardment types were not viewed as necessary in that conflict. All they needed was small and medium bombers, outside of fighters. This was the perfect test tube for types which Germany could apply against nearby Poland and France. Time was short, as were materials, men and money. Stukas were the most readily available type. They won Poland by destroying Polish air resistance in a single day. They knocked out France by aiding the armored forces in demoralizing already-decayed French armies.

The dive bomber which accomplished all this was a single-engined workhorse closely resembling in basic features America's A-17 and A-17-A by Northrop, which were almost the perfect models to fit the highly-specialized ground strafing tactics of the Third Attack Group. Strangely Uncle Sam suddenly ditched attack aviation, but not before producing a sensational-looking but impractical twin-engined attack plane called the A-18 and built by Curtiss. It turned out to be a dud because it was too much airplane for one pilot to handle — there were over 200 instruments and gadgets in his cockpit — while flying at zero altitude and firing multiple guns, dropping several types of small bombs and, if necessary, laying down gas or smoke screens. It was not maneuverable enough. Field tests proved this and the experimental order of 13 was never duplicated.

Here's where Goering showed his hand to us: His improvement on the good single-engined Stukas turned out to be the Messerschmitt 110, which doesn't look a whole lot like the A-18 but was shown to be similar in many respects by the Vultee analysis of a sample downed in England and shipped to this country. It was to be a dual purpose type. The Me 110 has fared in battle just about like the A-18 wound up in field tests over here. It is a flop, for the same reasons. After emulating America's single-engined masterpieces, Germany went so far as to copy our miscarriage. Moreover, they're now turning them out in mass

(Continued on page 26)

AIR ASSOCIATES INC.

Manufacturers and distributors of A-N (Army and Navy Specification), A-C (Air Corps) and NAF (Naval Air Factory) Standards.

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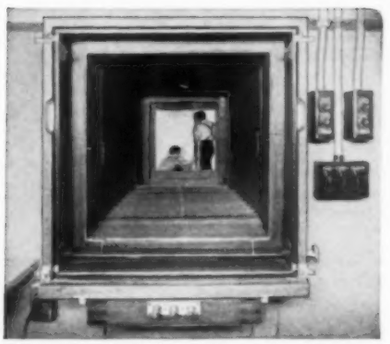
"Drafting by camera" thus has released literally hundreds of engineers from routine work and placed them on more important assignments. Drafting itself is simplified (complicated plans can be duplicated in less than five minutes); corrections expedited. Shop and experimental work are speeded. Toolmaking is improved. Inspection is aided.

The Martin-originated photo-drafting process has already made its impact felt upon American industry. Many aircraft and other industrial concerns have adopted the technique . . . answering in large measure the shortage of engineering personnel.

Photo-reproduction is just one of the many new methods by which Martin is saving man-hours and increasing production in the all-out drive for Victory.

The Glenn L. Martin Co., Baltimore, Md., U. S. A.

Martin Aircraft are first laid-out full scale in the mold-loft. From these accurate dimensions all details are designed—also at full scale—on metal sheets. Then Martin's giant camera reproduces these original drawings on other metal sheets, or on cloth, paper, glass, plastics or wood, for use where needed.



Camera Corridor: This view, through the bellows of the Martin photo process camera, gives some idea of its vast size. Believed to be the world's largest camera, it takes up every inch of two big rooms, can reproduce drawings up to 5′ x 10′.

Like Tin-Types of another day, plans are printed directly onto bare metal. Using jig-saw methods, workmen turn out experimental or small-quantity parts with practically no tolerance of error.

Jig Time is reduced by photo-layout. Jigs, and other parts or fixtures are built onto full-scale photo-layouts. This eliminates measuring and checking necessary in working from small-scale drawings.

Martin
AIRCRAFT
Builders of Dependable Aircraft Since 1909

Maintenance Prevents Accidents

A Specialist Warns Against Little Things Which Can Cause Big Headaches

By W. E. KONECZNY
CAB Safety Bureau Specialist

THE records of the Safety Bureau for the calendar year of 1940 and through August of 1941 indicate 368 reported non-airline accidents, fatal, serious, minor, and others caused by the failure of some part of the airplane, excluding powerplant. Of these a substantial majority probably could have been avoided by more rigorous maintenance procedure. This is substantiated, for instance, by the record for aircraft in the Civilian Pilot Training Service, where maintenance standards have been placed on a level higher than average, resulting in an improved maintenance record.

A brief picture of some of the maintenance "headaches" is hereby presented to point out to operators, mechanics, and pilots those parts of the airplane which appear to be responsible for most of the maintenance difficulties, as reflected by the accident statistics gathered by the Safety Bureau. Although primarily meant for the ranks of the less experienced field personnel, it is hoped that others may also find the information of some benefit. No discussion of specific phases of engine and propeller maintenance is included in this bulletin since this subject presents a distinct and separate problem. In view of the fact that for every accident due to the failure of some part of the aircraft structure at least two accidents are caused by powerplant trouble, a separate discussion of this subject is advisable.

Much of the following information is quite elementary, and yet it seems that even elementary principles of maintenance are being violated, either through ignorance or negligence. Three typical cases will serve to illustrate the point.

1. A very near accident resulted when, during a shallow turn, the rear spar fitting bolt fell out, allowing the wing to swing forward. Quick action on the part of the passenger sitting in the rear seat, who leaned out and held onto the wing while the pilot sideslipped to a landing, avoided what might have been a very serious accident. A subsequent inspection of the wing fittings disclosed that the cotter-pin on the front spar bolt of the same wing was missing, apparently forgotten during the last major overhaul of the airplane.

2. Another case involved a mouse, which decided to make itself a nest inside a fabric-covered wing. The owner of the airplane noticed its presence one day, but instead of uncovering a portion of the wing to check what damage, if any, was suffered, he continued to fly the airplane. Finally, during the performance of some acrobatics, the fabric came off the wing due to the failure of the lacing cord damaged by the mouse. Disregard for elementary maintenance precautions was responsible for this fatal accident.

3. In the third case, a potential accident was avoided when the owner decided to give the airplane a complete overhaul. A detailed examination of the structure revealed that at some previous time a steel tube in the fuselage had corroded through. The repair had been made by filling the corroded hole with putty, smoothing out the surface with sandpaper and spraying on a coat of paint!

An airplane cannot be properly serviced or repaired if the ground crew is not thoroughly familiar with all the details of its construction and operation. Every manufacturer distributes among the owners of the particular model involved, Service and Operation Manuals which contain valuable information for the operator. These manuals are revised from time to time and all such revisions should be carefully studied. In addition all certificated aircraft possess, as part of their Airworthiness Certificate, a set of specifications issued and kept revised by the Civil Aeronautics Administration. Compliance with the contents of these specifications not only with regard to operation but also with regard to equipment and Special Notes is, of course, absolutely essential for the airworthiness of the aircraft.

Manufacturers' Service Bulletins and CAA's Airworthiness Maintenance Bulletins, forwarded to the owners, are of no less importance. These are prepared on the basis and as a result of service experience throughout the country and their purpose is to assist the owner of the aircraft in keeping his airplane in as airworthy condition as possible. The owner should realize that both the Government and the manufacturer are keeping constant vigil for his benefit. But this in itself will not maintain the airplane in good flying condition unless the owner makes use of the available information and instructions.

When making involved repairs or alterations, it is advisable to contact the manufacturer who is in a position to supply pertinent drawings, material specifications, and instructions if necessary. The use of proper parts and material is, of course, essential, and yet only too often wrong parts or material with inadequate heat treatment is used in the field with sad results. On the subject of repairs, it is well to warn against the so-called "temporary repairs." When a repair is classed "temporary," obviously it should not be considered adequate for permanent normal operation.

Control System

The control system is more susceptible to malfunctioning than any other part of the airplane except perhaps the engine. The numerous movable parts, requiring cables, pulleys, bearings, bellcranks, etc., necessitate continual inspection and in some cases frequent adjustment.

With control systems composed entirely of push-pull tubes, there is required, as a rule, only the usual amount of care in seeing that excessive wear does not take place at bearings and that there is no corrosion, rust, kinking, bending, or loose bolts and brackets. Those systems, however, which consist mainly of cables, are much more susceptible to maladjustment and wear. Long lengths of cable have a tendency to stretch under load, also the length may vary somewhat with wide changes in temperature. Thus the system is frequently in need of adjustment to retain the proper "feel" of controls. When adjusting the turnbuckles, care should be taken not to use a wrench or pliers directly on the turnbuckle ends without first wrapping a piece of cloth around the part to be held. Scratches on highly stressed steel parts, especially if they have a polished surface are a rather common source of

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fatigue cracks, which, seldom seen by the naked eye, may ultimately cause a fracture of that part.

One of the most frequent troubles encountered in control systems is frayed cables. A cable which shows even the slightest sign of fraying means first, that its strength has been decreased, and, secondly, that it will continue fraying unless the cause of the wear is eliminated. It is therefore imperative, in cases where a cable shows a shorter than normal length of service, not only to replace it immediately, but also to investigate the adjacent pulleys, fairleads, etc., so that the same condition will not be repeated on a new cable. Pulleys correctly aligned and free to rotate, also properly placed fairleads seldom give reason for undue wear on cables. It is usually very difficult to inspect cables visually when they are installed in the airplane. Therefore, in order to ascertain the possible presence of fraying, a rag folded a few times should be wrapped around the cable and pulled back and forth along its length. In this manner broken strands can be felt pulling on the rag, in which case that portion of the cable should be removed for close visual inspection.

When inspecting cables, it is also important to watch for rust spots which are encountered quite frequently when the airplane is being operated under adverse climatic conditions, and when no protective anti-rust compound is used. Rust spots should be immediately cleaned with steel wool or other means, and if the penetration is great enough so that a clean surface cannot be obtained, the cable should be removed from service. It is bad practice to use heavy grease in places where cables rub against guides, inasmuch as dust collects on the grease to form a grinding compound which tends to wear away the guide or the cable. Another point of importance is the type of replaced cable. A non-flexible cable should never be used in place of a flexible one and vice versa, excepting when such a change has been approved by the CAA.

A condition which is particularly dangerous and which apparently is not fully appreciated at all times in the field is that of the "excessively tightened nut." This situation is considered hazardous especially in the control system. In a joint designed to rotate freely, a nut tightened more than necessary will restrict the rotation and might induce bending loads. Turnbuckle ends when attached to horns, bellcranks, etc., are particularly susceptible to this type of failure.

A rather frequent occurrence in aircraft equipped with dual controls is the "loose stick" which definitely comes under the category of negligence. On some airplanes, the second set of controls is removed and reinstalled quite often, which offers the opportunity of leaving the fastening nut unsafetied. The consequences of such an installation usually are felt during acrobatic maneuvers. In one case the pilot lost control of the airplane when the control stick came out of the socket while steep wingovers were being performed. In the subsequent steep dive, the excessive air loads tore the fabric and bent the ribs on one of the ailerons. A serious accident was avoided only when the occupant of the other seat made a recovery by the use of the other stick. Later it was revealed that the stick had not been safetied prior to take-off.

The above incident brings up a point which can often result in dire consequence, i. e., servicing or repairing aircraft without taking proper precaution against the inadvertant use of the airplane by some pilot who is unaware that the airplane is not in flying condition. Proper identifying means, such as a special tag tied to the throttle, grounding the airplane, will reduce the possibility of serious accidents, especially if the airplane is "on the line" while undergoing repairs or adjustments.

Wings and Control Surfaces

As in the case of control systems, surfaces of certain type of construction appear to require more care than others. Fabric-covered surfaces and biplane wings in general are more susceptible to the wear resulting from long periods of service than are metal wings or monoplanes.

Rigging requires considerable attention, being a very important factor in retaining the airworthy condition of the airplane. Some biplanes are especially sensitive in this respect with the result that even slight variations in the rigging to the wing cellule may influence adversely the flying characteristics.

A very frequent cause of serious accidents, especially during acrobatics, is failure of the coverings on old fabric-covered wings. Invariably improper maintenance is responsible for such failures. Very often the covering may appear to be, under a visual examination, in a perfectly good condition, but time and weathering are bound to have their effect on the seams, the lacing cord, and the fabric itself. It may, therefore, be advisable for the operator to replace completely all of the wing covering regardless of its apparent air-worthy condition after a number of years of operation, depending, of course, on the type of service and weather to which the plane has been subjected. This may seem like a costly procedure, but, in view of the difficulty of a thorough inspection and the suddenness with which fabric usually fails, new fabric will often pay big dividends.

An additional advantage of a periodical fabric replacement is the opportunity to inspect the interior structure. Wings and tail surfaces, especially of old wood-type construction, are always susceptible to deterioration. This is particularly true if the airplane is being kept out of doors most of its lifetime, and consequently subjected to wide atmospheric variations. Even with adequate drainage, the usual lack of ventilation inside wing and tail surfaces gives the effect of a steaming hothouse under the alternating action of humidity and the sun. Such a condition can result ultimately in a rapidly accelerating deterioration of the wood parts, the glued joints, and the fabric.

Occasionally in replacing some portion of the covering, poor technique is employed. It should be borne in mind that fabric covering, like any structural assembly, is only as strong as its weakest element. Therefore, not only the grade of cloth is important, but also the grade of lacing cord, reinforcing tape, etc., and the quality of workmanship should be as high as possible. Lightweight cloth should never be used where the standard grade is specified, and the importance of strong and well laced lacing cord, also the installation and punching out of the drain and ventilating grommets should be remembered.

Main attachment fittings and hinges, carrying as a rule substantial loads, need scrupulous attention. The usual difficulty experienced with all types of fittings is fatigue and weld cracks, mainly due to the continuous reversal of stresses to which the metal is subjected. Elongated bolt holes are also fairly common on older airplanes. Although often not easily accessible, fittings should be cleaned and closely inspected at frequent intervals. In most cases a magnifying glass will suffice in detecting even the smaller cracks, but sometimes it may be advisable to subject steel parts to a magnafluxing process.

Flaked or cracked paint should be regarded with suspicion as an indication of some unusual strain. Experienced mechanics can "sound" a structural member by tapping it with a hammer.

It is important to stress the necessity of obtaining good welds during repairs or altera-

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tions. A mechanic, not definitely known to be an experienced and dependable welder, should not be entrusted with work of welding a vital part. Although this applies equally well to woodwork, sheet metal work, etc., a welder's responsibility is much greater because of the difficulty of inspecting a weld once it is made. A weld may appear perfectly sound from the outside, but underneath there may be either burned material or lack of sufficient penetration.

When making repairs the broken parts should be replaced with material at least equal to the original structure in strength. However, in the case of control surfaces an arbitrary increase in material, which will result in increased weight, is not always advisable since it might change the balance of the surface. In designing aircraft, the manufacturer takes great pains to obtain the proper balance characteristics of the control surfaces to eliminate tendencies toward flutter. Even a few extra ounces of weight at the trailing edge may become detrimental not only to the flying characteristics but also to the structural safety of the airplane.

A number of accidents have been caused by previously incurred and undetected damage to wings or tail surfaces. Crowding planes in a hangar, where one of them unnoticed may scrape against another slightly buckling a few nose ribs, is a common occurrence. Another way to damage the wing or tail is by sitting on or leaning against it. Refueling the wing tanks also presents an opportunity for inadvertently denting the leading edge.

Landing Gear

Of all major components, the landing gear, due to its function, is subjected to most punishment, and as a consequence is responsible for a large portion of the total structural failures of airplanes. Many of these failures are noticed before they can cause accidents, but others develop suddenly during landing or take-offs often causing injuries and extensive damage to the airplane.

Some of the points mentioned in previous paragraphs apply also to landing gear difficulties, viz., correct heat treatment in replaced parts, welding technique, careful inspection for possible cracks with the aid of a glass or by magnafluxing, etc.

During taxiing, take-offs and landings, most parts of the gear are exposed to an accumulation of dust, mud, etc. Moisture thus accumulated increases the possibility of corrosion, which if allowed to develop, will finally result in appreciable weakening of the structure. The least sign of corrosion should be taken care of immediately, and protective coating or paint should not be applied over a surface which is not absolutely clean.

The most troublesome parts of the landing gear are the brakes, shock struts and retracting mechanism, although these are responsible for comparatively few serious accidents. Nevertheless frequent servicing of the above parts is important, and even the slightest signs of malfunctioning should be looked into and remedied immediately. Leakage of air in the hydraulic system, brake drum shrinkage and lack of proper clearance are some of the most frequent brake troubles. In flushing the brakes, care should be taken to remove the cleaning fluid which if left inside is liable to corrode the metal parts. Badly adjusted brakes are apt to malfunction when least expected. This is illustrated by a case where the parking brakes failed during starting of the engine. The airplane not held by chocks rolled into a parked truck sustaining appreciable damage.

The usual difficulty connected with shock struts is deteriorated packing, and, in order not to accelerate this process, it is essential to use only the hydraulic fluid recommended by the manufacturer. In view of the possibility of a sticking strut, leaking glands should not be corrected by tightening the nut, but should be replaced by new ones. Another reason why only the prescribed fluid should be used in the shock strut is its effect on the load absorbing characteristics, which are altered by the change in viscosity of the fluid. On some landing gears this condition may be sufficiently critical that the higher stresses imposed may ultimately result in a failure of some part of the structure.

Landing gear retracting systems have contributed to quite a number of minor accidents. The relative intricacy of the mechanism, whether the system be mechanical, hydraulic, or electric, subjected to impact landing loads, adversely affects its reliability. The maximum service will be obtained if the mechanism is given at least the checks and adjustment required by the manufacturer's instructions. Following is quoted from an accident report submitted by the pilot involved:

"Landing gear froze, could not lower due to dirt and lack of proper oiling. Recommend cleaning, inspecting and lubricating the working parts daily to assure operation of retracting mechanism."

Miscellaneous

It is vital that care should be exercised in the servicing and repair of not only the main structural components such as controls, wings, and powerplant, etc., but also of the various equipment. Only too often accidents are the result of improper maintenance of items which offhand seem of minor importance.

Deteriorated or cracked windshields and skylights have been responsible for a good share of trouble. Under certain atmospheric conditions, pyralin deteriorates rather rapidly, and with constant flexing along the edges of the frame, tends to crack. This condition naturally increases the possibility of the pane being blown out, thus disturbing the normal airflow around the airplane, and in some instances disturbing the stability to a considerable extent. Skylights at the top of the cabin are particularly troublesome in this respect.

Another constant hazard which until recently has not been appreciated by many, is the safety belt, either weakened in service or badly adjusted. A loose belt in the unoccupied seat is apt to interfere with the controls during rough weather or acrobatic maneuvers. It is, however, not this possibility alone that requires careful attention to the belt's condition. Even though not considered a direct cause of an accident, a deteriorated webbing or a malfunctioning buckle may mean the difference between a fatal accident and one involving minor or no injuries to the occupant.

Some operators have their planes washed and groomed only for the sake of appearance, not giving thought to the fact that if properly done this is also a part of the regular maintenance procedure. A combination of dust and moisture is an ally of corrosion and deterioration, and if allowed to accumulate will in time increase the maintenance costs appreciably. Particularly vulnerable in this respect are control surface hinges, which if not kept free from gravel, mud, grass, etc., may adversely affect operation of the controls.

Other maintenance points which have been sometimes overlooked are instruments, landing and position lights, equipment in the cabin, hardware, etc. Since it is impossible to foretell when the malfunctioning of these items may result in a serious situation, the necessary precautions should be taken. An empty fire extinguisher, a sticking door handle, or carbon monoxide from a cabin heater are conditions which every pilot wishes to avoid, and which can be avoided by proper maintenance. Loose objects in the cabin, such as map cases, cushion, etc., can cause very serious accidents, and should be fastened securely.

In conclusion it seems quite appropriate to mention a subject, which although only indirectly connected with maintenance, is of the utmost importance, namely, filling out of the various pertinent forms. The benefits, unnoticed perhaps by the operators, are many, It is therefore the purpose of these concluding remarks to clarify the significance, and point out the necessity of conscientious paper work.

When the operator fills out either a Repair and Alteration Form, a Structural Failure and Defects Report, or a Power Plant Failure and Defects Report, these are forwarded to the Offices of the CAA and copies of the Reports to the Safety Bureau of the CAB. The CAA after a study of all the data available in the forms and reports, either takes immediate action to safeguard against recurrence, or files them for future use in conjunction with the solving of maintenance problems and the issuing of Type Certificates for new aircraft. The contents of most Failure and Defects Reports are relayed by the CAA to the aircraft or engine manufacturers for their use in the future elimination of the difficulties involved. The Safety Bureau of the CAB makes a study of the information contained in the Failure and Defects Reports in the light of possible revisions to the Civil Air Regulations. The Bureau also makes use of these data in the investigation of accidents and in making the subsequent recommendations to the CAA. In general the various reports and forms constitute a basis not only for the immediate decrease of service difficulties on aircraft in the field, but also for future progress in the

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Obviously the reports and forms filled out in the field can be of use only if they contain correct and complete information. Too often the reports reviewed by the Safety Bureau contain such meager or misleading descriptions that they are practically useless. It is therefore important that care be taken to present in the reports and forms all facts available in as clear a manner is possible; sketches are always desired when describing parts of the airplane.

The information contained in the Aircraft Log Books also may be valuable at times. Especially in the case of an accident where there is suspicion of a structural or powerplant failure, the log book, if properly maintained, might offer a clue. Every pilot, operator, or mechanic is interested in accidents befalling other aircraft, especially if they are of the same model, and everybody concerned benefits from the knowledge of the exact cause. A clear and precise entry in the aircraft log book may avoid some future accident, perhaps to the same person who made the entry.

Although this bulletin has been prepared with normal peace-time operation of civil aircraft as a background, safety in the air for pilots and airplanes during war-time is even more important. As an aid to the war effort, waste of material and unnecessary loss of time due to grounded aircraft should be avoided. The details of maintenance procedure and the paper work involved may be entirely different at the training school, the Air Corps front line base or on an aircraft carrier, but the basic principle behind the endeavor is the same. Proper maintenance will keep them flying.

Enlist in your CIVIL AIR PATROL

X-C Flight Plans

The proper execution of a flight plan prior to departure is sound insurance against emergencies. Meteorology enters deeply into the flight plan, and pilots may have experienced difficulty in obtaining adequate information since war restrictions have been imposed.

Whether he flies for pleasure or for profit, the pilot is protected against weather hazards by an extensive organization designed to insure his safety. This protection is available for the asking, there being required only a normal amount of interest to obtain the information, then a normal amount of flying intelligence to use it effectively.

The complaint is sometimes heard that meteorological information from Weather Bureau forecasters is too vague, or that it is too difficult to "pin them down" to a definite opinion. Were this same pilot to taxi to the gas pit and announce that he needed service, without specifying fuel, oil, or amount, he would hardly consider it unusual if the service proved to be unsatisfactory. Yet, it is quite usual for a pilot to request weather information and volunteer few or no basic details to guide the airways forecaster. The emphasis which the forecaster places upon certain features of the weather situation is governed largely by the type of flight contemplated, equipment used, pilot limitations, route, distance and time involved, and so forth.

Before departing upon any flight away from the locality of the airport, the Safety Bureau recommends: 1. Check the weather. It can and does change remarkably over comparatively short distances. 2. When consulting with the airways forecaster, give him enough information to make the discussion apply to a specific problem. 3. Be conservative.

Pounds of Paper Work

By J. F. LINCOLN

J. F. Lincoln (right) examines 5¼ pounds of priority and order papers for $40.90 worth of arc welding electrodes.

IN the streamlining operations recently called for by Donald M. Nelson, Director, War Production Board, to eliminate wasted and lost motion and to direct all possible effort to the one vital task of producing war-vital ships, planes, tanks, and guns, one condition which certainly merits close scrutiny and correction is the amount of "paper" work required in putting through orders for essential materials in war production.

A typical example of this excessive paper work is a recent order for arc welding electrodes received by The Lincoln Electric Company, world's largest manufacturers of arc welding equipment, Cleveland, Ohio. The order was prepared with great painstaking, indicating the extent to which industry is going in order to comply with regulations.

The particular order which, itself, occupied a single sheet of paper, was accompanied by 199 priorities, each of which had three sheets of standard 8½-inch by 11-inch mimeograph paper, making a total of 597 separate sheets of paper, all of which required typed fill-ins. In addition each of the 199 priorities required two signatures, one by Notary, evidenced by Notary Seal. The weight of these priority extension papers was actually 5¼ pounds. In other words, 5¼ pounds of paper, which is, itself, a critical material, accompanied a single order, the actual itemizing of which required less than a page.

The material called for in the order was 700 pounds of arc welding electrodes to be used in essential production. The total selling price of these electrodes, exclusive of freight, was $40.90.

The chief point about the incident, which is by no mean an extreme case, is that more time was actually spent with pen, pencil and typewriter in putting through the extra papers required for the order than for actually producing the material ordered. The cost of the extra paper work in man hours also greatly exceeded the cost of actually producing the electrodes. Another important point is the serious delay necessitated in obtaining the 199 priorities. The man hours thus spent were a sacrifice of much-needed production.

The question raised here—in an effort to remedy a condition believed contrary to the best interests of war production—is whether a large part of this paper work might not be eliminated and the time and effort saved re-directed to the nation's main job of producing war equipment. The man hours of work applied to handling this one order by the manufacturing concern where it was issued were sufficient to produce a sizable volume of the concern's finished product.

Since this paper work is a standard requirement throughout war industry, literally millions of man hours must be spent in this non-productive work whereas this effort could be applied to actual war production.

THE Sky's the Limit

BY BILL GREEN

Military "Squeeze" on Private Flying . . . Suppression Must Not Come . . .
CAP Needs More Military Employment . . . Let's Keep Congress Informed

Plane's Utility Harnessed

SOME time back we made a plea that private flying should not be suppressed. We still do not believe that it should be hampered in any way. A great many things are now being done, however, to private flying, which are rapidly reducing it to such a difficult and slow process that many of its advantages of speed and economy are being removed.

About two weeks ago, we attended a meeting of the Texas Private Fliers Association, which was largely attended by members of the Civil Air Patrol and operators in the CPT, and during which we believe some important National Defense work was considered and acted upon. On our return from Big Spring, Texas, where the meeting occurred, we were forced to land at Wichita Falls on account of weather. We contacted the Wichita Falls communications station, who advised us that the Municipal Airport was closed to all traffic. The reason: The government had set up a large Army school at one edge of the airport and had plowed up the whole field in order to put down runways. It was raining at the time and no part of the field was usable. The radio station advised us there was a small commercial field south of town, but they did not know what condition it was in. We circled the commercial field two or three times and saw some rather deep tracks in the mud, which we later found were made by a Waco which had gone on its back, due to the muddy condition of the field. Nevertheless, since we did not have enough gas to go very far and did not wish to risk being lost in bad weather, we took a chance on landing on this field, which did prove to be quite soft in spots.

These days CAA highpowered stations will not give weather and wind data to anyone, even though they have the weather code. This seems a little like straining at gnats and swallowing camels to us, inasmuch as none of these stations have good enough signals to reach out much further than the weather conditions which surround them normally. Therefore, we had to get in a taxi, go clear through town, up to the other field to find out what the weather situation around different places was. The weather was bad everywhere, so we decided to stay overnight at Wichita Falls—it was almost dark, anyway. During the night it rained, so that the next morning the field was a quagmire and it was impossible to attempt a take-off. There was nothing to do but get on a bus and go home, which took all day.

Back at Wichita Falls a few days later, we had to go up to the Municipal Airport in order to get the weather, found that one can not get the weather code form at the CAA or weather stations, but must go out to some other building and get the code form from some clearance officer—then one has to go back and copy the code — then we had to go down to the Commercial airport, wait a while for the clearance officer to show up, get some gasoline and get going. From 7:30 in the morning to 9:42 was spent finding out the weather (which happened to be good), getting clear, getting gas, getting out of the field, etc. That was two hours and twelve minutes out of a busy life removed forever. Once in the plane we had landed in Tulsa one hour and forty-five minutes later. (Note: we are rapidly becoming expert walkers or foot racers, because almost every airport has gone to the greatest extreme to try to get the clearance offices, the weather stations and the hangars as far removed from each other as possible. Great ingenuity is being displayed in this project.)

Some Suggestions

In general, looking over this whole situation, where it frequently takes much longer to get in and out of the field than it takes to make a trip in an airplane, and where frequently, the trip can be made in automobile or bus about as quickly as it can by air, total time elapsed considered, we would like to make the following suggestions:

1) It seems ridiculous for the government to come along and take over a municipal airport, which has been kept up for years by the locality and the private citizens who base there and to completely plow and dismantle the field in order to construct something satisfactory to the Army, when all the time, the field is too small for ultimate Army requirements. We suggest that the Army would be a great deal happier and so would everyone else and no services of any kind need be disrupted (the airlines have discontinued operation into Wichita Falls, until the field is completed), if the Army would go out and buy its own field and be absolutely independent. We are almost certain that the Army will one day restrict all civilian use of the Wichita Falls airport, as they have at Oklahoma City. The Army has, at no particular saving over the expense they would have had if they constructed an entirely new airport, taken over the Oklahoma City field, which was maintained by private sources and private operations for many years and has completely stopped all private use of that field, thereby leaving Oklahoma City with no all-weather airport. This in itself is a distinct hazard to life and equipment, especially in bad weather. The Army has repeatedly tried to take over the Dallas and Oklahoma City airports and probably would freeze out private flying on those.

We are certain that after the war there will be a tremendous stimulation of private flying and it would be good long range planning for the military authorities to construct separate airports entirely, as they have done at a few points; then, if the Army no longer needs those fields, there will be duplicate facilities to take care of the expansion. Where the Army has con-

structed its own fields, it has done a marvelous job, usually in shorter time than if they tried to take over existing commercial fields. They have had all the space they needed; they have been able to lay out a program to their entire satisfaction. We have seen numerous such fields and wonder why the Army wishes to take over existing commercial fields, in view of the foregoing.

2) We believe that it would be smart business for the CAA, or the weather bureau, or the airport management, or all of them, to provide the simplest possible method of obtaining weather information, clearances, etc.

On one occasion in Dallas, we went from our hotel to the airport in a taxicab (fare 90 cents), applied at the weather bureau in the Administration Building for a code sheet and the weather code, were told that we could only obtain the code sheet at the clearance office—had to take a taxicab over to the hangar, which was approximately a mile away, obtained the clearance and the code sheets, came back in a taxicab (fare 35 cents each way) to the Administration Building, checked the weather, got the code fixed up, then had to return to the hangar in order to get our ship. Of course when the weather is good one can take a chance on getting the airplane out and taxiing over to the Administration Building, although there have been cases where people were refused permission to park their planes in front of the Administration Building or nearby, inasmuch as no guards are provided and airplanes may not be left unguarded. We don't see any reason at all why the weather bureau could not have a supply of forms on hand. They check your credentials before they give you any weather information anyway. It seems to us a terrific waste of manpower, effort, energy, rubber tires, gasoline and everything else, to have to do all this wild running around from pillar to post when we so urgently need to conserve all of these things. I would not be using an airplane if I were not in a hurry and neither would most other people. We are in a hurry because we have a lot of things to do. A lot of us are in the war effort clear up to our necks; we are working longer hours and more days per week than we ever did before and still we feel we are not doing enough. We work at the Civil Air Patrol, at the Civilian Pilot Training Program and other efforts in order to help things along.

Private Flying Is Vital

We urgently and sincerely suggest that the Army and Navy abandon all

BIG DOIN'S AT BIG SPRING

On April 11 and 12, way out on the wild and woolly plains of Texas, private flyers of Texas gathered in what is generally admitted to be one of the largest conclaves of planes and pilots ever assembled in the State. Some 350 men and women in approximately 100 airplanes descended on Big Spring, where the local Texas Private Fliers Association members, engineered by TPFA Governor Doc Malone, were hosts for one of the most enjoyable week-ends in Texas private flying history. Members of the Texas Defense Guard Aviation Branch and of the Texas Wing of the Civil Air Patrol dominated the occasion in their khaki uniforms and respective insignia, indicating that Texas pilots were organized and ready for any job they may be called upon to perform.

Shown in the photos below are the large number of private ships on the Big Spring Airport, the Sunday morning meeting of the Civil Air Patrol, surrounded by informal pictures snapped at the chuck wagon barbecue party on the Dick Simpson Ranch, thirty miles north of Big Spring.

ideas they may have of suppressing private flying completely and consider the following points:

A) Many of the airports now being used by the Army and Navy were constructed by and for private flyers, who paid their money and kept them in operation lo these many years.

B) A great many Army and Navy pilots were trained practically at their own expense, because of their interest in and because of the availability of private flying.

C) Practically every member of the ferry command paid for his training and obtained it privately on privately maintained airports and equipment.

D) The greatest mass of trained pilot material in the world is coming from and can still be obtained from private flying.

E) The Civilian Pilot Training Schools, which are now contributing heavily to the supplying of flying personnel for the Army and Navy are entirely private institutions, operated by private individuals and civilian personnel. Very few of these CPT contracts have been lucrative enough to the individual operators to enable them to work entirely on the CPT job. Most of them have been forced to do mechanical work, sell gasoline, sell storage and give flight instruction to a host of civilians as well in order to eke out a decent existence. The suppression of private flying will immediately require adjustments of most government contracts to CPT operators, in order to permit their existence wholly on government funds. The suppression of private flying will immediately result in cessation of service at several thousand airports over the United States of America. These airports live entirely on private flying and whatever advantage they may have from a military or civil defense point of view will be lost. Many airports must be maintained after each rain. Therefore, they will depreciate and many of them will actually become unusuable even for emergencies if they are not continuously used and maintained.

F) The Civil Air Patrol is potentially a vital and important force for civilian and/or military defense. Thousands of hours of flying instruction and other work is now being done by private individuals at their own expense, entirely in an effort to promote National Defense and safety. In the Civil Air Patrol, as in no other branch of the civilian defense, people have spent their money lavishly, in many cases, to do the work and considerable progress of long time value is being made. To stifle or kill such an effort, such interest and such a potentially important organization seems to us to be entirely thoughtless.

We suggest that the Army and Navy make immediate plans to utilize a great deal more effectively the equipment, personnel, efforts and interest of the Civil Air Patrol in patrolling our borders and coastlines and in doing such other work as they may find desirable, thereby relieving Army and Navy personnel.

Civil Air Patrol

Suggestions: We believe that the Civil Air Patrol should be more under the Army and Navy than under the Office of Civilian Defense and would welcome having it changed over. We believe that the Army and Navy should take steps to create, under the War Department or Navy Department, some form of officer commission and enlistment, which would permit Civil Air Patrol officers and men to be actively aligned and under the command of the War Department or Navy Department, with such arrangements as to permit them to stay on their private business and to use their own initiative and opinion in the matter of the time they would be able to give to the CAP or whatever the organization might be called. For example: Many CAP members are in flying schools, factories engaged in National Defense production, or other businesses considered vital or essential. Such people can still give a considerable amount of time and effort to the CAP, but could not, for example, without serious consequences, be ordered off to continuous duty in distant localities.

Most of us, however, could give a week out of each month, or two weeks or more out of a year, to do coastal patrol work and, as we pointed out once before, such an arrangement, if carried out among most private flyers owning airplanes, would put some 400 airplanes in the air all day, every day throughout the year. Such a force should be quite valuable and would amount, in case of extreme emergencies, to a possible force of 25,000 to 30,000 airplanes and crews.

What we say again then, is this: There is work to do, we have the manpower, the equipment, the facilities to do a great deal of work. Then why should we permit or even consider the stoppage of important large groups of people, equipment, facilities, efforts, etc., when this work must be done and we can do it? Our motto should be: "Let's get the job done and let everybody participate in it who wants to". It seems silly to be drafting some people to fight the war and not to permit other people to do something that needs doing, when they are able and willing to do it.

One additional note deserves attention: We are going to be paying for this war a damn long time after most of us are dead and it behooves us to get everything for our money, everything out of existing facilities that we possibly can in order to reduce, however little, the terrific load which we will have to bear and which our children and grandchildren after us must pay.

We are willing to do everything to co-operate, but we do not want to be suppressed. We can not see any reason for being suppressed. No private flyer with an existing valid license and airplane (providing the CAA and FBI have thoroughly checked them) should be suspected of any except the best intention towards the government and our American way of living. We believe in summary treatment of saboteurs, spies, traitors, etc. We do not believe that good Americans should be mistreated.

The Army and Navy listens to your senators and representatives, who are, supposedly, our representatives in our government. Your feeling in these matters, as expressed to your congressmen, may result in the continuation of private flying and an improvement in many details of operations. We suggest that you drop a line to your congressmen, in view of the fact that they are your paid representatives and they can not know what you are thinking unless you do communicate with them.

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Cadet

B-25's Make Bow in Raids Against Tokyo, Philippines

A new performer against the Japanese made its bow in April in Japanese-announced bombing raids against Tokyo and other homeland industrial centers and in American-announced raids swinging 2,000 miles up from Australian bases to Jap-held bases in the Philippines.

It was North American's fast B-25, which the Japs immediately described as the most superior medium bomber they have encountered. Its performance was incredible even

UNITED STATES VERY SOFT! AFRAID TO FIGHT GREAT JAPANESE PEOPLE! VERY SOON WE TAKE UNITED STATES ETC. ETC ETC
BELITTLING
B-25's

North American Aviation's cartoonist pictured the surprise Tokyo got when Dutch Kindelberger's B-25's carried the war to Nipland.

to Americans, for medium bombers haven't been known to range over such distances until now. The Tokyo raids remained a secret in Washington, but the Australian-Philippine operation was explained as having utilized some island bases along the way.

Later, the highlight of air heroics was revealed by President Roosevelt when he told how a Boeing Flying Fortress defied 18 Jap fighters to bomb enemy transports in the Philippines and return after downing 11 of the attackers. Pilot Captain Hewitt T. Wheless of Menard, Texas, saved the B-17 although two engines were gone (one shot away), a gas tank was hit, the radio shot off, the oxygen system destroyed, all but four control cables shot away, rear landing wheel blown off and both front tires flat from bullets.

Navy Gets First Timm

The Navy's first plastic-plywood training plane, the Timm Aeromold, was received last month by the Naval Air Station in Washington which was to begin immediate flight and destruction tests.

The craft, a low-wing monoplane, may be one of several types to be put into mass production for naval air cadet training if the tests prove successful. It is constructed of 90 per cent wood and glue and 10 per cent metal.

Chennault Promoted, Recalled to States

Claire Chennault, who retired from active duty as a captain five years ago and went to China to rebuild the Chinese Air Force and later to lead the American Volunteers, has been recalled to the States by the Army and promoted to the rank of brigadier general.

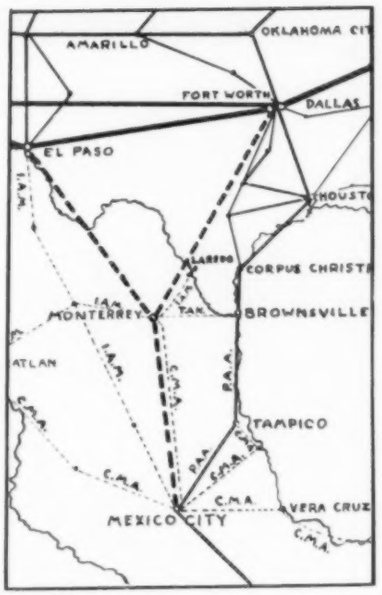
Later reports said Chennault, considered by many to be the world's outstanding authority on pursuit aviation, had requested to be allowed to stay with his units, which were to be disbanded and absorbed into the Army Air Forces.

His promotion was among 28, which included the nomination of Col. Frank O'Dowd Hunter, a pursuit ace of World War I, to the rank of brigadier general. When Chennault retired from the Air Corps to go to China, he vacated the post of executive officer of the 20th Pursuit Group, which was filled by Hunter a few days later.

Air Units in New Desert Army Corps

Glider troops and paratroops, together with a bombardment squadron and an observation squadron, are among units included in the formation of a special desert fighting corps soon to begin training in the California-Nevada desert.

Also announced last month was the creation of an Airborne Command within the Army Ground Forces, with headquarters at Fort Bragg, N. C. It will include the Army's parachute troops within the States, which will be expanded to three regiments, and an airborne infantry battalion using gliders. Col. William C. Lee, commander of the first provisional parachute group at Fort Benning, Ga., will lead the new airborne organization.



President Roosevelt reportedly was influenced by "urgent war needs" on April 18 when he approved American Airlines' application for routes from Dallas and El Paso to Mexico City via Monterrey, as shown by the map's dotted lines. The moribund CAB had rejected the application 4 to 1. Details of the new service were not immediately made public. Vital cargo service to key Caribbean and Panama defense bases is assured by the president's action.

Fairchild Comes South to Make 2-Engined Duramold Trainers

Having obtained an order for "large quantities" of a "new twin-engined crew training airplane" built of non-strategic Duramold, the Fairchild Engine & Airplane Corp. has taken over an "existing factory" in a Southern city and plans to build another large factory.

Duramold is the process of molding plywood and synthetic resins. Labor for the new plants will be recruited from local furniture and textile industries at which operations are being more and more restricted by war necessities. Half will be women.

J. Carlton Ward, Jr., president, said Fairchild is the first airplane manufacturer to go into the South and adopt the unique non-strategic material for large scale military production. He pointed out the Army ordered the planes in quantity even before the first plane was built or flown, paying tribute to the "vision and persistence" of Sherman M. Fairchild, board chairman, who led the Duramold development.

He described the new twin-engined trainer as being "large as many airliners with exceptional speed." Other details, however, were withheld.

Aviation Going Into Grade, High Schools

Teaching of elementary aviation in grade and high schools is planned under a program arranged last month by the CAA, Army, Navy and U. S. Office of Education.

"To initiate aviation education programs for pre-college age groups, which will be rapidly geared to the war needs and which will enable youth to prepare for a postwar period in which the airplane will bring about great changes in economic and social life" was given as the purpose of the program. Assistant Secretary of Commerce Robert H. Hinckley has advocated the program for several years.

Glenn L. Martin's factory airport is busier than ever with ferry pilots daily flying B-26's toward battle fronts. They're world's fastest bombers.

CAP Placed Under New Federal Status

The Civil Air Patrol for the first time last month was given "official Federal status" when Director James M. Landis of the Office of Civilian Defense ordered a tightening of regulations governing civil defense activities.

The order, which covered all OCD activities, prescribes standards of eligibility and training for membership. As a consequence, no person who is not a member may wear the official insignia or receive or use federal protective equipment to be issued by the Office of Civilian Defense.

Landis said the unauthorized use of any insignia designed by the OCD (such as the CAP's) is a federal offense and added his new rules prohibit the further use of the simple "C. D." army band, frequently used by trainees and other members of local civilian defense groups.

Glider Schools for Texas

A series of glider schools along the Texas-Oklahoma border which would make that area the nation's center of training in powerless craft is being considered by the War Department.

Two more schools similar to a large one already decided on for Ardmore, Oklahoma, are contemplated, as are numerous small branch schools and minor "recover" stations which would retrieve gliders landing at distances.

Navy Seizes Brewster

Navy seizure of three Brewster Aeronautical Corporation aircraft plants at Long Island City, N. Y., Newark, N. J., and Johnsville, Pa., was blamed by the government on "mismanagement". Deliberate slowdown by employees, among whom were listed enemy aliens, was alleged.

LEST WE FORGET

By C. L. DOUGLAS

PROPOSED FLYING MACHINE.

HERE, gentle aeronaut, you are gazing upon a contraption which, in all probability, was the draftsman's design for the first autogiro—and a right artistic job it is, too.

It had, however, one great and fundamental drawback. The designer, who submitted the sketch to Scientific American in 1874, couldn't figure out a way to make it fly.

But that was somewhat beside the point, the inventor admitting in an accompanying article that "the object is to show a good arrangement for other parts aside from the motor, a fireless steam engine assumed to be used."

By way of explanation this gentleman, who signed himself W. D. G., had this to say:

"The horizontal driving shaft passes through the frame of the car and is made to revolve by means of its cranks, worked by rods from oscillating cylinders below. At the end of this shaft are beveled gears which actuate the vertical wing shafts and so rotate the spiral fans.

"The arms which support the wing spindles are disconnected at the center of the car (under the canopy) and so arranged on the car frame that, by means of handles, they are easily and quickly made to revolve, partially and independently above the shaft, so that the gearing may always be in action. The object is to incline the wing shafts for the purpose of propelling the machine forward or backward, or turning it around when desired. When both wing shafts are vertical the car moves upward; when both are slightly inclined in one direction the car will not only rise but also move forward; and a contrary inclination of both wings stops the forward motion. A certain velocity of the wings causes the car to rise; a less velocity balances it in the air; and still less velocity allows it to descend gently."

Consolidated, Vultee, Douglas and other aircraft firms may be interested in the engineering of the landing gear and the emergency facilities for forced landings.

"The legs are supposed to be hinged to the body of the car," wrote the 1874 designer, "and have stout India rubber straps attached across them to act like springs, breaking the jar when the machine alights. Should the wings cease to revolve they will act, with the canopy of the car, as parachutes to break the fall."

"In this machine," he concludes, "every desired evolution seems to be provided for. Now, what motor shall we use? The whole machine, with all its appliances, can probably be made within a weight of 150 pounds and at a cost less than that of a good horse."

Seaplanes for the Army include Beechcraft AT-7A's on Edo Model 56-7850 standard twin float gear. Here is the first of several similar Edo installations.

Aeronca's efficient "grasshoppers" have had their cabins enlarged with greater visibility and are now designated L-58B by the Army, which is training liaison specialists in them.

Now it's Official . . . Army Announces Sub Sinkings Credited to CAP

Although most aviation writers and others close to civilian flying had known about it long before, official announcement was finally made late in April that the Civil Air Patrol had been responsible for several enemy submarine sinkings and had driven away other subs from tankers carrying oil to the AEF.

Commander Earle Johnson had withheld the news for some time and consequently it was not the Civil Air Patrol but the Army Air Forces which finally gave the CAP the boost it had needed so badly.

Maj. Gen. Follett Bradley, 1st Air Force commander, announced that the civilians, "carrying out missions directed by the Support Command of the First Air Force in many types of civilian aircraft, have spotted enemy submarines and survivors of torpedoed ships."

"On several occasions," he revealed, "enemy submarines about to attack tankers carrying oil to American overseas forces have dived in fright without releasing their torpedoes on approach of CAP planes.

"Several sinkings scored by Army and Navy bombers are credited directly to a tip-off by civilian volunteers assigned to patrol work in certain Atlantic areas off the U. S."

Units involved were not designated. But General Bradley said each volunteer task force involved was composed to the last man of CAP members. They brought their own planes, tools and spare parts and set up their own radio equipment for transmitting and receiving communications with patrolling planes.

Commander Johnson got in his say by declaring the CAP was succeeding despite bad weather and high winds.

Those who visited the national headquarters of the Civil Air Patrol in recent weeks have come away with new enthusiasm both as to the immediate usefulness of the program in America's war effort and the long-range value to aviation.

For the first time, the civil airmen of the country have been brought together as if in one big hangar to learn the kind of teamwork that has been needed for so many years to make aviation the force it ought to be in every American community. Only a few months ago, they were the most individualistic people in the world, flying their airplanes singly or in little cliques and clubs. The war has spun them into a centrifuge and so solidified the ranks of civil aviation that nothing is ever going to pull them apart.

Already the organization is paying big dividends just by the fact of spotting all the available aviation talent in the country and ticketing each man according to the jobs he can best do. The Civil Air Patrol has developed the only comprehensive roster of pilot personnel and already has supplied hundreds of men who would have been almost impossible to find had not this indexing been done.

A card with a few holes punched in it at odd intervals does not seem very exciting. But one of the most thrilling things we saw in Washington was a machine pouring out hundreds of these cards per minute. A request had come in for several pilots to fly on a mission requiring a rather unusual combination of skills. Every card the machine pulled out represented a man with these qualifications who was going to have an opportunity to go somewhere and contribute something special to the winning of the war.

The many for whom jobs are not yet open have a great incentive to give everything they have to the practice missions of the patrol. The way it used to be, once a man had his private license he could fly away with it and there was no particular urge to learn any more except just by flying.

Now the fellow that digs into his studies and does his drill and flight missions smartly can figure that maybe if he makes a better all-around airman out of himself, he will get a chance to fly where his skill will count, while if he gives the training directives a look and a promise, he will be left behind and someone else will go.

The series of training directives which Col. Harry H. Blee has developed as CAP training and operations officer are one of the best things that ever happened to civil aviation. After the military, civil defense, and organization procedures which the members have to learn to become civilian soldiers, the advanced courses in aviation are going to make seasoned aviators out of thousands of our pilots who have few hours behind them up to now.

While some squadrons are still lagging along with only a few hours of class work per month, some are turning out as often as four nights a week. At least one unit already has finished the 80 hours basic course.

Just what the specific missions are going to be for a given unit cannot be foretold fully at this stage. But in the past month, negotiations have been in progress with the National Park Service and Forest Service for forest patrol work which promises a sizeable job of work for a good many squadrons and gives a break to the inland units.

Success of experimental courier service for the Army is another "natural" which can release many military ships and aircrews for more important service elsewhere. Other major projects are on the fire but can't be talked about as yet.

Meanwhile, dozens of local untis are finding a great variety of interesting work to do on their own or in co-operation with wartime agencies in their vicinity. The national command is wise in letting the units use their vivid imaginations rather than trying to hold them to a stereotyped pattern.

In consequence, there are many examples of versatility. Nevada has organized mounted and range commands to reach areas where planes can't land. Alabama is sending back messages from planes by pigeon post. Michigan has a searchlight unit. Whole photographic clubs have joined up with the equipment in some areas. In almost every state, the boys have some special project to brag about. We don't think any unit whose members are still sucking their thumbs and waiting for something to do is quite bright.

Now that the organization period is passed, the squadrons are at work, and good flying weather is ahead, the Civil Air Patrol is moving along so rapidly that new developments are to be expected almost every week.

All this has been accomplished with a headquarters staff smaller than that provided for a single squadron, not counting the stenographic pool which handles the applications and tabulation work.

By doing its jobs right and on time, the patrol has won the respect of officials both in Washington and out through the country. It is being given more and more to do and there is good prospect that it soon will be implemented with more adequate funds.

CAP Proves It Can Haul Military Cargo

An experimental 30-day test of courier service, conducted at the Middletown, Pa., Air Depot by the Pennsylvania wing of the Civil Air Patrol, has proven highly successful. More than 2,277,000 pound-miles of Army cargo were flown in the first 20 days of the mission, despite bad weather.

Five planes were based at the Harrisburg Airport, six miles away. Pilots were on the alert from 7 a. m. and were able to report at the Middletown Air Depot within 15 minutes of notification of a trip. In addition to cargo missions, an Army officer whose plane was incapable of flight was carried a considerable distance by one of the CAP ships.

Trips were made to points as far distant as Georgia and South Carolina. The experiment has made it possbile to get the "bugs" out of the preliminary plans. According to Wing Commander William L. Anderson's report, "The response at all Army fields has been enthusiastic and officers promised to make additional use of the Civil Air Patrol as they become more familiar with its functions."

Mamie in CAP, Too

The girls have formed a squadron of their own in Atlanta, Georgia, with 20 pilots and a total enrollment of more than 50. Officers are Ann Johnson, commander; Ruby Mullins, training and operations. All planes of the unit are radio-equipped and all the girls have attained a transmission speed of 10 words a minute or better in code.

40,000 Enlistments Received by CAP

Enlistments in the Civil Air Patrol in mid-April passed the 40,000 mark with more than 36,000 service records having been cleared with the FBI in Washington.

Following are figures of total enlistment applications received from each State and percentages showing the ratio of applications to total pilot population of the respective States. The national average is 40.2%

		%			%
Ala.	471	48.2	Nebr.	412	30.2
Ariz.	265	35.8	Nev.	196	83.3
Ark.	571	45.3	N. H.	314	76.7
Calif.	2,551	21.2	N. J.	1,027	40.3
Colo.	292	19.5	N. M.	260	42.5
Conn.	585	62.9	N. Y.	3,160	42.7
Del.	256	98.2	N. C.	662	46.8
Fla.	853	34.1	N. D.	148	23.2
Ga.	697	45.0	Ohio	2,488	58.6
Ida.	381	50.3	Okla.	1,178	45.2
Ill.	2,228	44.3	Ore.	687	42.9
Ind.	1,554	75.5	Pa.	2,054	38.4
Iowa	1,132	49.2	R. I.	210	55.7
Kans.	1,040	43.3	S. C.	525	49.7
Ky.	431	66.4	S.D.	280	43.4
La.	768	51.9	Tenn.	726	44.1
Me.	385	72.5	Texas	1,518	22.2
Md.	529	45.8	Utah	425	45.7
Mass.	694	27.5	Vt.	124	41.3
Mich.	2,364	62.0	Va.	325	22.3
Minn.	1,046	46.4	Wash.	795	31.6
Miss.	157	20.3	W. Va.	466	41.2
Mo.	1,169	36.4	Wisc.	861	50.9
Mont.	423	49.8	Wyo.	118	29.8

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Mid-West Sector, Hensley Field, Grand Prairie, Texas

YOU must request, *by mail*, an application from the Personnel Officer on which to list your flying history.
YOU *may* have the qualifications. Preference is given to men who can qualify for commissions in the Army Air Force.
Please address your letter to: Personnel Officer, Mid-West Sector Ferrying Command, Hensley Field, Grand Prairie, Texas.
Your letter will receive prompt attention and an application will be forwarded to you. In the event that vacancies do not exist, your application will be filed for future demand.
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Here's How to Practice Bombing, Border Patrol, AA Tracking and Panel Reading

More and more activity has been reported by CAP units using training directives detailing various basic missions such as patrol, bombing, rescue, parachuting supplies, highway traffic control, blackout observance, anti-aircraft personnel training, panel reading, radio and forest patrol.

The missions are intended for the training of pilot-observer teams and are required of all pilots having at least 50 hours of flying time and all observers. Here's a brief outline of some of the missions and how to operate them:

PATROL

This mission simulates the work done in flying a border or coast patrol mission. State or county borders or a waterfront may be used. The pilot-observer team will fly along a prescribed section of the border, keeping well to one side of the border while still close enough to keep it under close watch. Distinctive markers should be placed along the line at points unknown to the pilot and observer. Description and location of each marker will be given in the pilot-observer report. Such markers may be an auto in an unusual location, cloth strips, a smudge pot, or anything else out of the ordinary.

BOMBING PRACTICE

This will develop accuracy in dropping bombs on a target from a plane flying at low altitudes and will develop skill in handling the plane at such altitudes. From an altitude of not less than 200 feet, one-pound paper bags of flour are dropped on a designated target. The observer releases the "bombs" while in level flight, and from up, down and cross-wind approaches. A waiver must be obtained from the CAA field inspector before carrying out this mission, and special care must be exercised for safety.

ANTI-AIRCRAFT PERSONNEL TRAINING

When anti-aircraft unit commanders so desire, CAP units may co-operate with them by performing "tracking" missions, in which a plane is flown at given altitudes over specified courses while the ground personnel practice training their detectors and guns on the plane as a target. Close liaison with the anti-aircraft units is necessary.

PANEL READING

This simulates military missions in which messages are given airmen in flight by means of signal panels laid on the ground. Strips of cloth four feet wide and twelve feet long form the panels. They are laid down singly or in combination to form numerals, such as 1, 2, 3, 4, etc., or symbols such as crosses, squares, triangles and the like. To each figure or symbol a definite meaning should be ascribed in accordance with a prearranged code. For example: A square may mean to return to point of departure, while the numeral 2 may mean that reinforcements are needed. Panel reading may also include the dropping of messages. Army artillery units are skilled in co-operating with airplanes in this manner for actual war work.

Need of Mechanics, Radiomen Emphasized

One of the pressing needs of the Civil Air Patrol is for A & E mechanics. Radio technicians, capable of operatng and repairing two-way equipment, are another.

The National Aviation Training Association has recommended that CAA-approved schools enlist faculty members as chief mechanics, and give students actual experience on maintaining CAP planes.

Where no A & E schools are located, CAP units have been asked by national headquarters to train their own men by enlisting local garage mechanics. Local radio amateurs are also being sought to operate ground sets during practice maneuvers so they can learn control tower procedures and be able to participate in real missions.

Forest Protection Major CAP Mission

National Civil Air Patrol headquarters has conferred with federal agencies on plans for using the CAP in protecting forest areas. Already some state units have prepared for closely co-operating with state forestry departments, undertaking special training and assembly of equipment.

During the war it is feared that sabotage efforts in the timber areas may become a problem during the dry seasons. Within forest areas are power plants, pipelines, and other strategic facilities which must be protected against fire. Constant vigilance from the air will make possible immediate detection of fires. Ground forces can be summoned or men and supplies can be dropped by parachute for prompt action.

National headquarters has advised that the CAP will work closely with state and federal authorities in the matter.

REVVING UP

(Continued from page 4)

show, it's a cinch that Georgia skies will soon be full of Bell fighters.

From all reports, Bell is just as pleased with the location of his new factory as the rebels are. Plans for training several thousands of workers are being worked out, adequate housing programs are in the mill, transportation problems are being solved—months before the factory will be completed.

At the dinner celebrating completion of arrangements for the new plant, Larry Bell reported that the whole aviation industry has expanded tenfold since Pearl Harbor. "The experienced personnel in every airplane factory in the country necessarily has been spread thin to make room for the necessary influx of workers," Bell said.

"We shall bring into this Georgia plant only a nucleus of a force that can drill the new workers in the jobs they are to handle. As soon as we can, we shall relieve these relatively few imported workers and send them back to their own jobs. We expect the work at this plant to be operated by Georgians alone within as short a time as possible."

What's in a Name?

One of our research-minded readers, hearing that we were planning an edition on Texas, sent us the following:

"I have noted the following interesting names of some of the populated localities in Texas: Big Lump, Dime Box, Zulch and North Zulch; Graball, Nada, Fointblank and Sample; Caesar, Texas, and Bigfoot, Texas. I find that Shiner is near Gindale, and Belcherville is just north of Saloona; however, Boracho, Texas, is clean across on the other side of the State. There is Cactus, Melon, Okra, Pancake, and Noodle. There's Cuthbert and Eustace, Mickey, Cleo, Lonnie, Kittie and Snook, Texas. Then there's Necessity, Eulogy, Energy, Industry, Security and Commerce; Bonus and Gratis, Dinero, Cash and Bonanza. There is Sublime, Elysian Fields, Angel City, and finally, Paradise. But I think Pidcoke, Texas, Tivydale, Texas, and Twitty, Texas, are in a class by themselves."

Texas Spirit

If you're fed up with the labor racketeers, refresh yourself with this account of Texas spirit: At the Army's sub-depot supply at Waco, the commanding officer received a letter from all of the employes. They told him:

"During this period of extreme emergency, we, the undersigned employes of the Waco Sub-Depot Supply, Waco, Texas, volunteer to work as many hours per day, seven (7) days a week, if and when necessary, as the Sub-Depot Commander may direct, with the understanding that no compensation will be derived."

The letter was signed by George W. Whitlock, Amos D. Alley, John H. Mack, Alvis T. Barkley, Elroy C. Untermeyer, David Comb, Joe B. Reed, Harry P. Ankerson, Jr., Earline Carpenter, Carmon F. Beavers, Maurice Cole, Martin J. Arnold, Elmer Cunningham, Wynell L. Woodall, Marie Helen Adler, Catherine Camp and Francis Collis.

Keep 'Em Landing, Too

If you want to work on a worthy project, here's one that guarantees some facilities that will be useful after this war is over. Remember how we have all campaigned for "flight strips" along highways?

Now that ten million dollars has been authorized in federal funds for the construction of "military flight strips", many state and county highway departments should plan immediate construction of these valuable aids to aviation. The project, to be carried out in co-operation with the Army Air Forces, provides that the Commissioner of Public Roads make necessary engineering surveys and plans and also authorizes him to enter into agreements with local highway departments to acquire such new or additional rights-of-way, or lands.

The accepted definition of a "flight strip" is a "landing area not less than 200 feet in width and not less than 1,800 feet in length (the area could be as large as 800 by 8,000 feet) with clear approaches, located in a highway right-of-way or adjacent to a public highway, on public land, developed with state and/or county funds, including federal aid." Army authorities are backing the flight strip plan because they involve a minimum of expenses, can be used for parking military convoys, aid greatly in moving large numbers of airplanes across the country and make possible a wide dispersion of Army airplanes to prevent their loss in case of attack.

Each Air Force commander will cooperate in selecting flight strip areas and regional managers of the CAA will be consulted regarding nearby facilities. Military flight strips generally will be located within a radius of from 5 to 50 miles from air bases and will serve as auxiliaries to those bases.

Mars to Fly Again

Glenn Martin's huge Navy "flying warship", which can range to Europe and back non-stop, will take to the air early in May. Severe fire damage suffered recently has been repaired, and Martin claims she's sturdier than before.

Martin claims preliminary designs already have been worked out for a bigger flying boat, if anyone ever orders one. Says it will be a 250,000-pounder, able to carry 80 tons of bombs or cargo to Europe at a top speed of over 300 miles per hour. If he says he can do it, it's just as well done as far as we're concerned.

JUST AMONG OURSELVES

(Continued from page 10)

production over there, while Douglas, Curtiss and Vultee are back on the single-engined pattern—with vast improvements. Our A-18 went on to become A-20's, B-25's and B-26's, each of which is unexcelled.

Goering, who has shown himself to have been duped, will be on the way out any day now, if he hasn't already been dismissed. He was brilliant before the show caught up with him, and while Udet lasted. What will Hitler do with both of them gone? In his hurry he manufactured pilots in quickie schools, while America took years to turn out Randolph Field pilots who could be — and now are — air generals in practice as well as in name.

Except for the lull in attack aviation after we junked it without explanation only to catch up again, America has been careful to design its airplanes for specific missions and not to stray far from them. Down through the years our air leaders have learned that effectiveness is sacrificed when a specialized type is employed for dual purposes. We've tried improvising fighters as bombers, at one phase experimenting with time bombs to be dropped on bomber formations. But the only pursuits which have dropped bombs in this war were the orphaned P-40's of Bataan. Only in the pinch will B-17's be risked on small targets and B-25's dare big ones meant for Fortresses. To employ air power as Germany has done indecisively against England and Russia is to fritter away strength without adequate compensation. You'll never see Hap Arnold climb out on that kind of a limb.

We are just beginning to see America's air tactics unfold. Until recently the action against the Japs had to be more or less makeshift — surprise caused that. The "impossible" operations over distances of two and three thousand miles mark the arrival in Australia and other jumping off places of well-planned and properly assembled air task forces. They have also reached England and the Middle East. They have been waiting in many other strategic bases to be released—undeniable proof of America's leadership in brains and equipment to fight a global war which was forced upon her.

The absence of long-range Axis air task forces against England, Russia and America continues to grow more conspicuous. This, with other discrepancies appears as proof of Axis unpreparedness to carry on world-wide war in the air. Events this summer will end any doubts.

The Strange Case of Civil Aviation

Though there's encouragement in the Army's demand for 2,000 civilian instructors out of CPT and in the submarine hunting assignment of Civil Air Patrol on the eastern seaboard, full utilization of civil aeronautics is not yet in sight.

WHEN the Army Air Forces Flying Training Command called upon the Civil Aeronautics Administration last month to produce 2,000 instructors—1,000 elementary and 1,000 secondary—by June 15, CPT received the strongest gesture of approval ever given by the military.

There have been minor straws in the wind indicating that the Army, and occasionally the Navy, gave tacit approval of conservative appropriations for CPT. Never has there been in CPT's history a strongly worded, direct statement of commendation by the military. Too often, CPT has been damned by faint praise.

The importance of the Army's call for 2,000 instructors—*immediately*—cannot be over-emphasized. There is no question in our minds as to the ability of CPT operators to do the job. But in order to do it they must appreciate the tremendous responsibility that rests upon them. If they fail in this—their big chance—they jeopardize the continuance of CPT.

The civil aviation family should be proud of the assignment. However, there is yet no indication of any sound, long-range planning or definite policy regarding the *full* utilization of the nation's rich civil aviation resources.

The uncertain program-to-program operation of civil pilot training, both college and non-college phases, springs from the same lack of planning and foresight of our military leaders, who, either in their preoccupation with their own terrific expansion or in sheer ignorance of the potentialities of civil aviation, continue to pursue the hit-or-miss policy of bygone years.

The Army's urgent call for private pilots to take the new instructor course emphatically illustrates these two points:

1. That the Army jumps up all of a sudden, apparently in a tight, and is *forced* by necessity to fall back on civil aviation to furnish them instructors, and furnish them quickly—in sixty days.

2. That if CPT does the job (and we believe they can) full, unreserved credit should be given the program for the first time in its history (although it has done even more significant jobs in the past) thereby providing long-range year-to-year programs with plenty of money to operate on instead of month-to-month operations.

There is no guarantee that such will be the case when the instructors are made and sent to work. What will happen then? Will there be a call for 2,000 more? We don't think the Army knows what it will want in sixty or even ninety days.

The strange case of CPT remains unsolved.

The more you study the expanding training program, the more you dig into facts and figures and all the acute problems that arise every day, the more you become convinced that our military services are passing up their best bet when it comes to enlisting cadet material.

Just recently the Navy lowered its requirements for aviation cadets, following the Army's precedent permitting high school graduates to take the exams for appointment. Although about two years late, the Navy is at least progressing and every little bit helps. They have yet to do away with the ridiculous regulation prohibiting married men in the Navy to take flight training.

Meanwhile both Army and Navy are using every means known to mankind in a wild attempt to encourage enlistments. Radio programs, spot announcements, full page ads in the daily papers and a plenitude of high-powered sales talks lead us to believe enlistments "ain't what they ought to be". In our opinion, the CPT could do the best job of enlisting cadets than all the sound and the fury now in progress.

You can't as effectively talk or sell people into military flight training as you can *lead* them to it. We believe a regulated expansion of CPT into every town of moderate size boasting an adequate airport and operator would provide more cadets than the services could handle.

Here's how it would work: Set up the primary program to take 100,000 (or more) high school graduates who can meet the physical standards. Give them CPT elementary training close to home and make them sign up for the duration. Many young men with the consent of their parents would accept primary training on their local field far more readily than immediate shipment off to some "far-away" military flight training base. If you doubt this statement, ask some of these parents with eighteen and nineteen-year-olds. They don't want their Johnny to go off and start flying those big airplanes a thousand miles from home which you read about crashing every day.

Let 'em get their "wings" with Joe and Dave and Harry, and the rest of the boys they went through high school with. Let 'em live at home until their parents discover that Johnny has learned to fly and should be in the Air Corps after all!

Somebody is missing the boat as regards this psychological deterrent. There's plenty of pilot material available. Getting to it is something else. Home town operators can get it—and train it.

The secondary, advanced and specialized phases of CPT need not be disturbed—they can be expanded also according to military needs. The primary instruction provided to cadets by CPT need not count for anything in the military training program, although who would deny that a boy with a score or so hours solo time is far better off than one who hasn't felt the controls? He hasn't had time to develop any bad habits, nor does he believe he's the world's hottest pilot.

He could be transferred immediately to Army Primary upon graduation from CPT.

People in private aviation don't want any credit. They simply want to be utilized to their full capacity. Many good flight operators and pilots have given up their operations and gone into the ferrying command because they weren't being used. Others are in the ground forces. One CPT operator told us the other day he figured he was working fifty per cent of his time for the Japs. He said he could easily double his production of pilots and instructors with his present facilities. Furthermore he said he was willing to waive all profit from operations for the duration. All he wanted was enough to live on over and above his operating expenses. There are a thousand fixed-base operators just like him all over the nation. But they're all not wanted—just a few of them.

A similar situation exists in the ranks of other civilian airmen who, if used to their full capacity, would provide a strong, active auxiliary air arm the likes of which the world has never seen. It would make Britain's Dunkirk boat brigade look like a camp-fire girls' contingent.

That standing Army now actually exists—some 50,000 of them in Civil Air Patrol, a well-organized group of civilian aviation enthusiasts ready to tackle any assignment given them. Unfortunately tied to the Office of Civilian Defense, CAP is still struggling for recognition five months after Pearl Harbor.

A modicum of recognition came last month when the daily press and general interest magazines published glowing accounts of the yeoman service CAP is performing along the Atlantic coast on submarine patrol. Added to this widely publicized and worthy service are a few isolated jobs of merit, created by the individual initiative of unit commanders throughout the forty-eight states, that prove CAP's ability beyond the shadow of any doubt. But these occasions of utility are small technically and geographically when compared with the potentialities of civil aviation's militant gang of organized private flyers. Like CPT, CAP struggles along without fame or favor in the eyes of many military men.

We make but one request. We ask but one hearing. And that is, an intelligent survey and appraisal of civil aviation's resources for *full and complete* utilization in the war effort. Let the Army and the Navy abandon the easy practice of disregard, and in many quarters actual disrespect for one of the richest resources America has at her disposal that can be used *now* to make up for all the years we wasted in neglect of air power. Let the top-ranking officers of our Army and Navy place qualified men in charge of a program to actually determine what civil aviation can and should do and cease all this step-child treatment that is gradually destroying a wealthy portion of the flying family's resources.

Permit the CPT to unloose a flood of cadet material for the Army and Navy in creating a pilot mill the likes of which would stagger the imagination . . . a program that would make a pee wee of Hitler's pre-war glider training mill which provided the preliminary training for a couple of hundred thousand Luftwaffe pilots. Let the CAP take on some additional big league tasks similar to the Atlantic coastal patrol, releasing combat pilots for the major theaters of this global war.

Lacking imagination and the acceptance of new ideas, certain dead timber in our military commands actually lost the first battles of the war for us. It's high time we continued to clear out such dead timber and build a fire that will shine as a welcome beacon throughout the world that America is going on the offensive.

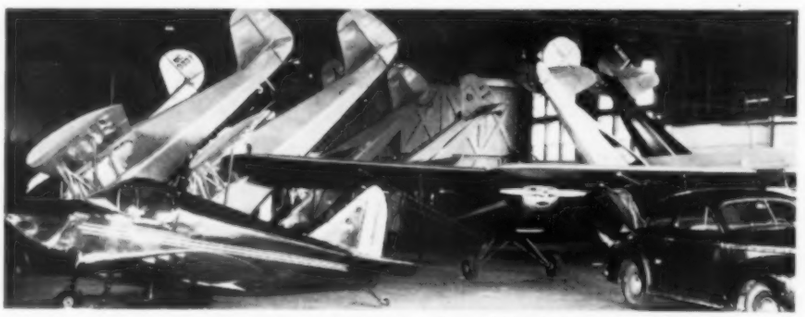
Every producer of raw materials, every manufacturer, large or small, every source of labor supply is being exploited to the utmost for the greatest national effort ever put forth in the history of the world. But the power and resources of civilian aviation are being used to about one-tenth of capacity.

The full responsibility for this sorry state of affairs rests squarely upon the training commands of our military forces. Until they act decisively the strange case of civilian aviation, its pathetic partial use in the over-all plans for building airpower, will remain unsolved.

PRELUDE TO USEFULNESS

Civil aviation's growing demand to be used all-out in the prosecution of this war places the issue squarely before high ranking military authorities charged with such responsibilities. But not all the responsibility rests upon their shoulders. Civil aviation's responsibility is just as great. We must eliminate the one blot now on the record—that of flagrant violations of civil air regulations. We must fly according to the rules *without exception;* we must see that business is conducted as it should be in order to guarantee operations on those fields fortunate enough to be designated; we must avoid flying over restricted areas; we must get used to flying under clearances and weather codes; we must maintain our aircraft and engines toward achieving the greatest safety record in history; we must, above all, realize that we are at war and that present restrictions are for *National Safety and Security!*

The days of "monkey-business" are over. To keep Civil Aeronautics going for the duration and to receive the many jobs we are asking for, let's show a record to Uncle Sam that proves we mean business also.



ON THEIR NOSES FOR THE DURATION?

A common sight in hangars throughout the nation—privately owned airplanes in "dead storage," with only their tails in the air. Forced out by the closing up of many small fields due to designated airport restrictions, the shut-down of all private flying on the West Coast, by draft-boards taking many pilot-owners into the walking army and by cuts in CPT operations, the large number of civilian airplanes now out of action represents a tremendous loss in equipment and manpower potentially capable of vital work in the war effort.

Boeing Brandewiede Bowen Hinchliffe Zink Royall Rowland

PERSONAL NOTES

• WILLIAM E. BOEING, pioneer aircraft builder and founder of Boeing Aircraft Company at Seattle, Washington, has returned to the organization to aid in the war effort. Volunteering his services, Boeing will act in an advisory and consultant capacity for the duration of the war, though remaining disassociated from the company.

• G. J. BRANDEWIEDE, an executive of Curtiss-Wright Corporation's airplane division for many years, has been named general manager of the new factory Curtiss-Wright Corporation will erect at an undisclosed location for the building of military transport planes almost entirely of wood and non-strategic materials.

• President J. H. Kindelberger, president of North American Aviation, Inc., has announced the promotion of two officials of the Dallas plant. K. P. BOWEN, formerly assistant chief engineer and production manager, has been advanced to assistant factory manager; and J. W. HINCHLIFFE, formerly assistant purchasing agent, has been made purchasing agent.

• WILLIAM G. ZINK has been placed in charge of a new aviation branch office of The B. F. Goodrich Company opened last month in Dallas, Texas. Zink has been with Goodrich since 1918 and has been operations manager of its aeronautical division for the past three years.

• JOHN E. ROYALL, executive vice president of Menasco Manufacturing Company, has been elected president of that company. He fills the post made vacant by the resignation of A. E. Shelton early in January.

• HARRY T. ROWLAND, veteran in the field of aeronautics and former sales manager for the Glenn L. Martin Company, has been elected a vice president of the company. Mr. Rowland, a native of North Carolina and a graduate of the United States Military Academy at West Point, will serve as assistant to the executive vice president, Joseph T. Hartson.

• Manning, Maxwell & Moore, Inc., of Bridgeport, Connecticut, announce that their Dallas, Texas, representative, ALFRED KENT, is now Ensign Alfred Kent, having joined the U. S. Navy.

Their representative, FRED CRABBE, who formerly covered the Corpus Christi territory, has been transferred to Dallas and for the duration will cover Ensign Kent's former Dallas territory.

• Election of LOUIS W. WULFEKUHLER to the position of secretary of the Lockheed Aircraft Corporation has been announced by President Robert E. Gross.

The post had been held since the founding of the company by Cyril Chappellet, who recently was made a vice president of the company.

At the same time the directors adopted a resolution creating the office of comptroller for Lockheed, and elected DUDLEY E. BROWNE, formerly chief accountant for the company, as the officer.

H. R. CAMPBELL, who has been manager of the finance department of Lockheed, was elected an assistant treasurer.

• CHARLES F. NIELSEN, who for the past six years has been general traffic manager of the Lockheed and Vega Aircraft Corporations, has been appointed director of traffic and transportation for the U. S. Army Air Forces, according to an announcement by Lieut. Gen. H. H. Arnold, commanding general.

In his new post Nielsen will control and direct all transportation matters pertaining to the air forces, General Arnold stated.

• PERRY V. OGDEN, newly appointed factory manager and general superintendent of Boeing Aircraft Company's Seattle plant, is in charge of production of the famed Flying Fortress. Ogden returns to the company after an absence of eight years. From 1928 to 1934, he served as Boeing production chief, and more recently has been with Consolidated Aircraft Corporation as production control supervisor.

• EUGENE W. NORRIS, formerly chief, Specifications Section, Aircraft Engineering Division, Civil Aeronautics Administration, has joined the staff of the Technical Department of the Aeronautical Chamber of Commerce of America, Inc., for full time work on the affairs of the National Aircraft Standards Committee.

• EARL HERRING, previously vice president, has been made president of Kinner Motors, Inc., to succeed B. B. ROBINSON, resigned. Along with his new position, Mr. Herring will continue as general manager, the post he has held since the company's inception.

• JACK WISEMAN, former automobile executive, has been appointed special representative of the Ryan Aeronautical Company with headquarters in Washington, D. C., according to an announcement by T. Claude Ryan, president. In his new duties, Wiseman will closely co-ordinate his activities with SAM C. BREEDER, Ryan sales manager.

• EDWARD H. CONERTON, aviation executive, has been appointed assistant to First Vice President Ray P. Whitman of Bell Aircraft Corporation, and has resigned as eastern representative of Kinner Motors, Inc. Associated with numerous aircraft organizations since 1925, Mr. Conerton served during World War I with the Engineer Corps. He is a member of the Quiet Birdmen, and Aviators' Post, American Legion, New York City.

PRODUCTS

Kwik-Klip Designed to Save Labor

A new fastening device designed to save labor on wiring, conduit and tubing installations has been added by Bendix Aviation, Ltd., of North Hollywood, Calif., to its extensive line of cushion and bare clamps.

This product known as a Kwik-Klip is constructed as a half loop and merely fits over the wire or conduit—not bolted around it.

Installation is unusually fast, as it is only necessary to secure the Kwik-Klip itself to the airplane structure or other attaching surface through the single mounting hole and the wiring or conduit is firmly held in place.

Kwik-Klips are supplied with or without Speed Nuts and with or without Neoprene cushion. The cushion is permanently bonded to the clamp with the exclusive Bendix Thermo-Weld process, and does away with the need for wrapping wire or conduit with tape for protection at the point where the clamp is applied. Kwik-Klips range in size from $\frac{1}{8}$" to $1\frac{1}{4}$".

Enlist in your CIVIL AIR PATROL

Spring Engineering Booklet

The American Steel & Wire Co. has produced a book, "Manual of Spring Engineering," which is one of the most comprehensive ever printed on spring engineering and design. A 132-page publication covering all types of springs, the manual is well-illustrated and contains special Nomographic charts, numerous tables and a complete analytical index.

Copies may be obtained by writing — on a business letterhead — to the Sales Promotion Department, American Steel & Wire Co., Rockefeller Building, Cleveland, Ohio.

New Ranger Radio Distributors

In an announcement made by David A. Marcus, manager of Electronic Specialty Co., Los Angeles, manufacturer of Ranger Aircraft radio transmitters, receivers and interphone equipment, two more distributors in the east have been appointed to handle the sales of the Ranger equipment.

In the State of Michigan and the adjoining counties of Indiana and Ohio, the Aircraft Instrument Service, Inc., at Detroit City Airport, will represent Electronic Specialty Co.

Ranger radio sales in Kentucky will be handled by H. H. Richardson, 1183 East Broadway, Louisville.

Enlist in your CIVIL AIR PATROL

Aircraft Production Soars As Appropriations Multiply

America's aircraft industry accomplished more expansion in April with new plants in the South and Mid-America going into production while officials credited existing facilities with exceeding their quotas. A production rate of 42,000 planes a year has been passed and the 60,000 plant rate will be reached before fall, the House Naval Affairs committee was told by President William P. Witherow of the National Manufacturers Association.

Speaker of the House Sam Rayburn told an audience in Texas that a rate of 3,300 planes a month had been reached some time ago while Senator Prentiss M. Brown of Michigan assured his supporters we are outproducing all Axis nations combined.

Meanwhile, total appropriations for aircraft in the current war, together with announced plans for future appropriations, have approached the $40,000,000,000 mark, which is one-quarter of all U. S. defense appropriations totalling $160,889,714,255 in the last three years. Over and above the 33,000 planes provided for three months ago in the Fourth Supplemental Defense Act, Congress has acted to expend $6,990,000,000 for 31,070 more planes. The Army Air Corps will shortly ask funds for another 23,550.

Other milestones: President C. R. Smith of American Airlines became an Army Air Force colonel in the Ferry Command. . . William E. Boeing left retirement to return to Boeing Aircraft Company as an active executive . . . Charles A. Lindbergh went to work for Ford at Willow Run's engineering research department . . . Senator Truman blamed poor planning by the armed services and the old OPM for holding West Coast assembly plants from capacity because of weak subcontracting . . . A consolidated B-24 flew 2,200 miles from Newfoundland to England in 400 minutes, clipping a 3-month old record by one hour.

First Navy "E" awarded to an industry for aircraft production was unfurled by Rear Admiral John H. Towers over a crowd of workers at the Pratt & Whitney Aircraft Division of the United Aircraft Corporation.

NORTH AMERICAN— Amplifying an announcement made recently that the company is returning $14,000,000 to the Government in the form of price reductions on contracts in progress, J. H. Kindelberger, president of North American Aviation, has declared that standardization of training airplane designs by the Army and Navy, permitting smoother functioning of the aircraft production system, had been largely responsible for the saving effected.

Kindelberger also disclosed that additional savings, amounting to almost $60,000,000, will be transmitted to the Government through reduced prices on contracts now held by North American.

AERONCA— At the annual meeting of stockholders of the Aeronca Aircraft Corporation of Middletown, Ohio, last month, Carl Friedlander, president, announced to the stockholders that the fiscal year ending December 31, 1941, was the best in the company's history in regards to earnings, gross scales, and growth. Greatly optimistic over the continued growth and expansion of the company, Friedlander reported that the company was now actively engaged in important defense work for the United States Army. Currently building large numbers of "Grasshopper planes" for use by our armed forces in courier and liaison work, Aeronca is, in addition, engaged in other important military work.

Carl Friedlander also declared that Aeronca would continue its extensive research program and would be in a position to introduce several new type airplanes at such time in the future as hostilities cease.

AMERICAN PROPELLER—Due to the growing demand for hollow steel propeller blades for defense, the American Propeller Corporation, Toledo, Ohio, has found it necessary to greatly expand its manufacturing facilities. A new plant has been built, consisting of a pilot plant owned by the American Propeller Corporation and a production plant owned by the Defense Plant Corporation. Production facilities have been set up to manufacture large diameter blades in quantity.

The United States Army Air Corps and Navy have been using these hollow steel blades for several years on training planes, and sizeable Government contracts are now held for the larger diameter blades.

Several design blades are now under development, in addition to those in production, and present plans call for a complete development program of propellers and a family of blade diameters and designs.

The American Propeller Corporation was incorporated in 1941 to manufacture propellers and hollow steel blades formerly manufactured by the Lycoming Division, Aviation Manufacturing Corporation, Williamsport, Pennsylvania. The machinery, equipment, manufacturing processes, patents, etc., formerly owned by the Lycoming Division were acquired by the new corporation.

Officers of the American Propeller Corporation are: William F. Wise, president; Douglas Shaw, treasurer; and R. G. McKendry, assistant secretary.

AVIATION CORPORATION — Tremendous expansion of plant facilities and production of war materials was achieved last year by The Aviation Corporation and associated companies, and greater strides are assured in 1942, according to the corporation's annual report.

Victor Emanuel, president, reported that the backlogs of war orders on the books of the various companies in the group were recently substantially increased, and are in the aggregate among the largest in the country.

The major products of the group are military and naval aircraft, airplane engines, propellers and parts, and naval vessels.

BENDIX— A new design of Power Brake Valve incorporating an external adjustable leaf spring lever has been introduced by Bendix Aviation, Ltd., North Hollywood, California. The equipment is an approved item already in production for installation on Air Corps airplanes.

In this valve the hydraulic pressure at the brake port is directly proportional to the mechanical force exerted on the brake lever. This gives sensitivity and "feel" to the brake pedal.

A bomb-like belly tank, giving added range and designed for jettisoning in flight, marks Bell's new P-39D now in volume production.

The valve also provides a pressure warning feature as the brake pedal will depress with no load when there is no pressure in the supply system.

CURTISS-WRIGHT— Curtiss - Wright Corporation will erect an aircraft manufacturing plant at an undisclosed location to engage in building military transport planes almost entirely of non-strategic materials, it has been announced by Burdette S. Wright, vice president of the organization in charge of its Airplane Division. It will be the fifth factory to be operated by the Curtiss-Wright Airplane Division.

The new aircraft type, said Mr. Wright, was designed to transport personnel, equipment and supplies to distant combat areas with the speed required by modern warfare and will be constructed largely of wood and materials not included in the list of priorities. Metal will be used only at points requiring extreme strength.

To speed the output of large numbers of this military transport plane for the armed forces, a great percentage of its structure will be subcontracted. As its parts are so designed that they can be built in the plants of furniture manufacturers and other wood-working organizations, manpower, equipment and materials not already engaged in the war effort, can be utilized.

G. J. Brandewiede, an executive of the Curtiss-Wright Airplane Division with offices in St .Louis, Mo., and an active figure in the American aviation industry, has been appointed general manager of the new factory.

FAIRCHILD—Fairchild Engine & Airplane Corp., in its annual report recently made public, shows a consolidated net income for the year 1941 of $541,079.20, as against a comparable deficit of $60,771.51 for the previous year. Though the consolidated profit from the operations of the company's Aircraft and Ranger Aircraft Engines Division and from its wholly owned subsidiary, Duramold Aircraft Corp., was $1,658,676.50 for 1941 as against $57,860.80 in 1940, provisions for Federal taxes was only $21,727.83 in 1940 and was $1,217,571.08 for 1941.

GOODRICH— Development by its research laboratories of a superior type of hard rubber made from Ameripol, the synthetic rubber which its chemists created, is announced by The B. F. Goodrich Company, Akron, Ohio.

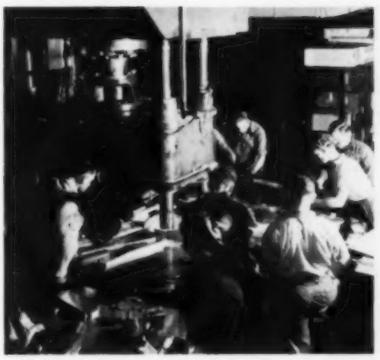
According to a report just issued the new synthetic hard rubber will stand temperatures 100 degrees Fahrenheit higher before softening than the best hard rubber made from natural crude.

• Announcement is made by The B. F. Goodrich Company, which a short time ago introduced new lines of static-discharging and oil-resistant V-belts, that these lines are now being carried in stock in all popular sizes of A, B and C cross-section. Previously the belts had been made only on special orders.

B. F. Goodrich sales engineers point out that the new development will extend the field of hard rubber, since it overcomes many of the limitations which had restricted the service of this type of rubber under extremely severe conditions.

UNITED AIRCRAFT— In a recently released booklet entitled, "Our Part in the War Effort," United Aircraft Corporation in a statement of principles dedicated themselves to the great task of producing the goods and rendering the services required by the war effort at the maximum rate and the lowest cost consistent with the required quality.

United Aircraft Corporation pledged themselves to limit profit to that necessary to maintain the business in the sound financial position required to execute the task; to stimulate output and reduce costs by rewarding individual initiative and performance with adequate compensation, and to provide the best possible working conditions; to take all measures consistent with accomplishment of the task to the end that after the war we can help restore peace and stability in the shortest possible time.



Big short-cut in Lockheed production came with installation of this 250-ton single-action hydro-press with rotary table handling more than 20,000 parts in 8 hours with only a handful of men—replacing system in which two larger presses required 20 men to handle only 12,000 parts in 8 hours.

KINNER MOTORS— Kinner Motors, Inc., manufacturers of aircraft engines, showed net earnings of $148,256, after deductions for taxes, during the first six months of the company's fiscal year, June 30 to Dec. 31, 1941, it has been announced by Earl Herring, president and general manager.

This was equal to 33.2 cents a share on the 455,798 outstanding shares of stock.

For the comparable period in 1940 the company's net was $72,249, equivalent to 16.2 cents a share.

"STANDARD Products—
Standard for the Industry"

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Suppliers to the U. S. Army Air Corps—to the Royal Canadian Air Force—to the British Royal Air Force—and to leading American aircraft manufacturers.

Thermostats and Pressure Relief Valves and Tanks for Liquid Cooled Engines

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DAYTON, OHIO

Companion to Courage is CONFIDENCE!

Gallant men defending liberty in the skies confidently believe that we build the *best* into each *Bendix-Scintilla Aircraft Magneto, Spark Plug and Ignition Switch.* Their confidence in us is the most potent incentive to strive for perfection that our craftsmen could feel. All the compulsion which tyranny can enforce upon slaves is feeble by comparison.

SCINTILLA MAGNETO DIVISION
BENDIX AVIATION CORPORATION
SIDNEY, NEW YORK

BENDIX SCINTILLA

THE WORLD'S FINEST AIRCRAFT IGNITION

Aircraft Steel Celebrates One Year in Texas

Completing its first year of operation in Texas, The Aircraft Steel & Supply Company recently celebrated the event at the Mirror Room of the Baker Hotel in Dallas. Those attending included: O. W. Wortman of Wichita, Kansas, president of the company and an admiral of the "Flagship Fleet;" Mr. and Mrs. Marvin Mourning; Miss Madge Givens; Mr. and Mrs. Loyd Shelby; Mr. and Mrs. Darwin Mafus; and Mr. Claude Munds.

Charles E. (Doc) Spooner, manager of the Aviation Division of Berry Brothers, Detroit, also joined the party. Dinner, dancing, and the telling of April fool jokes were features of the program.

The Aircraft Steel & Supply Company, with headquarters at Wichita, Kansas, now has branch offices in Omaha, St. Louis, Tulsa, Dallas and Kansas City, Kansas.

Aircraft War Production Council Organized

Eight major Pacific Coast manufacturers of the warplanes now fighting on every front have announced organization of the Aircraft War Production Council, Inc.

The Council will co-ordinate and extend the established practice of the individual companies in exchanging information and pooling facilities—which already has made a major contribution to increased production.

Consolidated, Douglas, Lockheed, North American, Northrop, Ryan, Vega and Vultee—builders of bombers, fighters, trainers and troop transports—are the member companies of the Aircraft War Production Council. While main offices of the Council have been established at 7046 Hollywood Boulevard, Los Angeles, plants of the member-companies are situated throughout the nation.

Cessna Offers Prizes for Ideas

Seven thousand dollars in United States Defense Stamps and Bonds will be paid to employees during the next year for prize-winning ideas for increasing plant efficiency, Dwane L. Wallace, president of the Cessna Aircraft Company, has announced.

Entries will be judged within two weeks of submission by a special eight-man committee representing the basic branches of the manufacturing organization. Every employee submitting a suggestion will be notified whether it has been accepted or rejected, and if rejected, the reason.

The minimum prize for any suggestion accepted will be five dollars in Defense Stamps, and the monthly awards will run up to a one hundred dollar bond, with a total of $500.00 to be given every month. Every three months there will be a quarterly Grand Prize of $250.00 in War Bonds to be presented for the outstanding suggestion of that period, which award will be in addition to any prizes won in the regular monthly competition.

Foreman's Policy Manual Published

The Foreman's Policy Manual, published by National Foremen's Institute, Inc., Deep River, Connecticut, is designed to assist supervisors in the fulfillment of the present industrial program.

Written from a long, practical experience, the Manual covers such subjects as "The Foreman's Job," "Legislation," and "Company Policies," and is supplied in loose-leaf binder form so that it may be prepared to fit the particular needs of the company using it.

That section entitled "The Foreman's Job" is general in nature and of value to all foremen. This is included in printed form. The balance of the material, concerning specific rules and regulations, will, of course, have to be prepared and inserted by the company using the manual.

The binder will be furnished with company name or insignia stamped on the front in gold and complete set of index tabs. The price is $6.50.

New Book Gives Important Electrical Data

A new and comprehensive catalog and reference book, just published by Automatic Electric Company, contains a wealth of useful data on the relays and other electrical control apparatus manufactured by that company. It is especially timely for manufacturers in the war industries, as the use of electrical control units and equipment in the aviation, radio, marine, and other branches of the vast war production machine, is steadily growing in scope and volume.

Every effort has been made to make this book not only complete in its listings, but also as useful and informative as possible to engineers and product designers.

Engineers and other responsible persons in companies whose activities are tied into the war effort are invited to write for free copies of this book to American Automatic Electric Sales Company, 1033 West Van Buren Street, Chicago.

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Littelfuse Locked Cap Assembly, U. S. Pat. 1922642

YOU CAN'T LOOSEN THE CAP ON A

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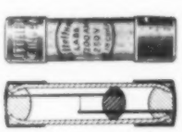

No cement used. As diagram shows, fuse ends are constricted, providing for exclusive Littelfuse process of **everlasting** lock. Cap with markings will not be lost! Littelfuse process also waterproofs and hermetically seals filament.

Littelfuse First with Aircraft Fuses

Aircraft Industry brought its fuse problems to Littelfuse from beginning. Littelfuse was **first** to design fuses especially for aircraft—and LITTELFUSE **has steadily led the way in products for developing demand ever since.** Send for complete Catalog.

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PORTS OF CALL

Correspondence from Airports and Airways

Amarillo, Texas

You Can Land at English Field

On tour with Tony—Gone for the duration is Thornton Oxnard . . . off to Florida to do something for Pan Am . . . betcha it's ferrying bombers to some spot. And Fred Smith went off to California . . . to look over the grounded planes. 'Tis a sad thing to see all the nice airplanes sitting around doing lots of nothing . . . better bring 'em back here to "keep 'em flying!"

"Zoom" Reams and Dorman Marshall joined the whole of English Field, and Municipal, too, in worrying about "Red" Holmes when he had the strep throat . . . 'cause he always had to answer the 'phone and talk to keep things happening; and everybody knows you shouldn't talk with that stuff . . . but it didn't worry Red.

You'll be glad to know that English Field is all wrapped up from the construction job and anyone can land . . . in fact, you're *invited* by Charlie Thieriot, who is the head man in charge of the works for the duration at least. He and Shelby Kritser, formerly with Pan Am and now the inventinest man at the Mechanical School of Amarillo College, are the two busiest men in town. In fact, Charlie is too busy to make speeches and gets up and says "routine" and sits down . . . 'tis a fact.

John Corn, a sure enough ground instructor, and "Pinhead" Batson, who is the X-country instructor, report to one and all that they had a swell time at the party held while Fred was west, for all the airport gang. SOUTHERN FLIGHT was invited but had to catch the midnight out and leave the best bunch of fellows and gals to a nice dinner and dance . . . drat it! We got a rain check and hope it rains . . . but soon!

Off to Houston. 'Bye, now!

TONY HAGMANN

Enlist CIVIL AIR PATROL in your

Dallas, Texas

Society Goes Flying for Uncle Sam

On tour with Tony—Dallas Debs are looking so-o-o sad . . . now that Clarence Norsworthy has given the Ferry Command at Hensley Field a break . . . and Murray Samuel is hot after a license out at Love Field. Heard that E. W. Mudge, Jr., is aviation bound . . . 'tis well! . . . 'tis well! . . . and with Major "Buster" Martin back in the army . . . this town will be a lonesome mess.

Robert P. Dabney "Culvered" around the city in his nice green number . . . E. A. Brown likes the T' crafts out at Hudson field . . . W. H. Duneway goes for the Aeroncas over at Millsap's diggin's at Hampton Field.

Buck Rowe is just barely able to wait for the new ship the factory is getting ready to replace the burned job he lost in the fire at Love. . . . a Stinson, to be sure, to be sure! . . . and the airline boys—Tom Oster, with Delta, and Paul Stambaugh, with "B" Liner—both said such nice things when they renewed their subs to SOUTHERN FLIGHT that we went out and bought two new air mail stamps.

Wm. H. Coleman 's gonna read "all this and the ads, too" . . . for a couple more years . . . Charles Coster . . . (CAA) . . . *will* give all the d—(for darn) flight checks he can, but will the weather department please give at least six more hours of daylight so he can increase the number of pilots for this fair city?

Coffee Department: Tom Collins with his arm all wrapped up 'cause it was busted . . . Gene Royer . . . Joe Wasson . . . Bill Walter . . . Dan Regan . . . Lou Foote. And on account of we've been all over the state this last month, we can't tell any more about the home town . . . h'ain't been home enough to see "what's cookin', Doc." . . . See ya!

TONY HAGMANN

Enlist CIVIL AIR PATROL in your

"BET AMERICAN CAN DO IT"

YES—And you would be surprised at the variety of jobs that American Radio is now doing and can do.—A VARIETY OF FACILITIES—Few plants in the Southwest can turn out the great variety of Specialized Production units that is commonplace in our plant.—From fabricated sheet metal and machined parts to the most delicate electrical and radio apparatus, we are completely equipped to handle countless items now needed in our WAR PROGRAM.—Yes, and it is no longer just DEFENSE. Therefore many manufacturers and prime contractors will find that it pays to contact American Radio Manufacturing Company for their many sub-contract requirements.

"Specialized Production to Your Specifications"

ELECTRICAL CONTROL PANELS
INSTRUMENT PANELS
BOX ASSEMBLIES
JUNCTION BOXES

TERMINAL PANELS
FUSE PANELS
DISTRIBUTION BOXES
WIRING CABLES

MACHINED PARTS AND FITTINGS
FABRICATED SHEET METAL
PARTS AND FITTINGS
SPECIAL ASSEMBLIES

AMERICAN RADIO

LOVE FIELD MANUFACTURING COMPANY, INC. DALLAS, TEXAS

DESIGNERS AND MANUFACTURERS OF RADIO COMMUNICATIONS EQUIPMENT AND ACCESSORIES

Fort Worth, Texas

City Gets Instructors School

Fort Worth is to have a school to train private flyers for instructors. Sponsored by the CAA as part of its CPT program, this specialized school will be conducted by Les Bowman's Fort Worth Aviation School. Ten flyers have met requirements for the school, others have registered.

Requirements for enrollment in the school are as follows: Flyers must be between 21 and 42 years of age, have a minimum of 106 flying hours, pass physical examinations, and be able to attend ground school and flight classes regularly. Finally, every flyer taken in the school must agree to accept an army or navy Air Corps assignment to any field of service at the conclusion of the course. The greater part of these assignments will be as instructors at primary and basic training centers and in the ferry command.

Fort Worth pilots accepted in the first class include Barney Reynolds, Robert W. Fulghum, Norman H. Koerner, Orval Massey and Arlo A. Troup. Henry Boykin and Rev. Thurman Scheumack have also registered for the course, which includes 60 hours of flight instruction and 120 hours of ground school.

Recent soloists include T. H. Black, Bill Cain, and Cecil Black. . . . Mrs. Clyde Burns recently took her private flying tests. . . . Slated to win his private license after an absence of several months from the skyways, is Jack Hendrix. . . And out for an instructor's rating is Lester Chin, the Chinese flyer, who works at North American's Grand Prairie plant. . . . Jimmie Ray of North Side Baptist Church, is now going after his commercial license and might become one of the very few flying chaplains in the nation's Air Corps.

Wedding bells have rung for Robert Joe Lucas and Mildred Nimmo; Glenn Malmin and Avis Burton; Sam H. Lane and Evalyn Daniel (Sam practically grew up around our field—we remember his first solo flight); and W. T. McWhorter and Geraldine King.

Joe Ascue is the third member of American Airlines' radio communications department at Meacham Field to go after a private license, running up his fifth hour of dual flying recently. Meanwhile, Glenn Malmin, who soloed in March, has about nine hours. E. A. Dumas won his license several months ago. All hope later to become airline pilots.

A famous Fort Worth flyer is being followed by a hustling son, believed to be one of the youngest yet to win his commercial flying license in Texas. The father is "endurance-record" Reg Robbins . . . the son is 18-year-old Jack Robbins.

Your reporter hopes soon to be vacationing in California. A "certain" marine promises some sky rides over San Diego. . . . Be seeing you.

MARGARET EWING

AVIATION
NEEDS
MEN
Who Are
SOUNDLY
TRAINED
Luscombe manufactures planes. It KNOWS how employable men must be trained. And the Luscombe School of Aeronautics turns out the type of graduates the aircraft plants WANT.
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WEST TRENTON, N. J.

Enlist CIVIL AIR PATROL in your

Hobbs, New Mexico

Another CPT Program Under Way

Birth certificates, affidavits, pictures, and CAA inspector have been the most important things around the Hobbs Me-Tex Airport lately. During the last four months, the CAA inspector has issued identification cards to more than 150 pilots from Hobbs and this district.

Our summer session CPT Program has been completed and another is under way. Students completing training include: Johnny Ellison, Walt Fairweather, Bill Elliott, Edward Granath, Merle Howell, U. J. Lanford, David Williams, Tig Flowers, Jack Mullins, and Thomas Baucom. Six of the ten students are awaiting call for the Army Air Corps, and the others have placed their applications for secondary training.

Students participating in the present experimental non-college CPT Program for 1942, include: Gerald Dean, John Adams, Duane Burd, Elbert Creech, Dick Hardin, Lawrence Dunaway, Bill Hollis, Clint Hon, Bob Prater, Tommy Thomas, Jimmy Clemens, Elmore Bullock, Bob Dolton, Howard Davis, Troy Henley, H. A. Hull, Jake Jones, Joel Mills, Louis Sherrill, and Olen Elliott. Solo students include: Hardin, Prater, Thomas, Bullock, Dolton, Davis, Dean, Hull, Jones, and Sherrill. Ground School Instructors Glenn Allison and James Fox are also flying enthusiasts. Neither has soloed, but they are building up dual time as fast as possible.

J. M. and George Key of Oklahoma City are here preparing for instructors ratings. Morbur George has taken the written test for commercial and instructors rating and is awaiting inspector day. CAP is developing fast in this area. . . . Frank Yoas of Sanderson, Wallace Anderson of Pecos, and Ray Hart of Artesia are hangaring their planes at the Me-Tex. . . . Woody Clark, Earl Caulkins and Toots and Leonard Goedeke are instructing for the Army at Stamford. . . . Clarence McGarvey has accepted a Civil Service position in the Navy as Mechanic Instructor in Chicago. . . . Cecil Meadows is instructing in the CPT program here.

John Patterson and James Reed of the Albuquerque CPT office, and Ollie James of the Ft. Worth office were here recently organizing the present CPT Program.

DOROTHY STALEY

Enlist CIVIL AIR PATROL in your

Houston, Texas

Charlie Scholes on Tour with Tony

Houston—as Charlie Scholes would work it over: "Look at this weather . . . it sure did booger us up . . . we had a good deal up the way and *this* came along . . . 'sthworst I ever saw! . . . Say, did you know that Henry Kriegel was over in Memorial getting cut up? Sure! . . . was flat on his back for twenty-one days. He had a lot of medical attention from some fine looking characters . . . that's the worst I've heard . . . yes, sir!

"Come on, Hagey, let's eat! You're looking at a growing boy and if we don't go over and mingle with some of those characters at the

"SOON" IS TOO LATE . . . .

Get Your Instructor's Rating NOW!

The Army needs Instructors and Service Pilots *immediately*. If you expect to help win the war in the air, start to increase your time today.

AIR ACTIVITIES offers complete Aviation Courses. Fly at Houston's modern municipal airport. Write for full particulars TODAY.

MUNICIPAL AIRPORT

AIR ACTIVITIES, INC.

HOUSTON TEXAS

Airport Cafe, I'll be too weak to chew . . . it's about time we took care of that business anyway, Hagey.

"How do you like the new runways? Frank Christian is the head man out here, now . . . yep, the airport manager . . . he did a little duty out in California, but he's home now. . . . Yeah, 'Toots' Womack is up at Corsicana, I hear, and R. M. Loftis manages Air Activities here . . .

"So you want to 'tour' a little down here, Tony? I've got a little time, a good set of tires on a good car full of Humble gas. Think nothing of it . . . I'll tour you around. Let's see where you're going: Ellis Gotcher, Precision Aeromotive, Loftis, Air Activities, Kriegel, Aviation Enterprises, Sam Houston Airport, Dixie Plating — why sure! That's a cinch . . . let's go! . . . we'll get that deal all hooked up in no time . . . no time at all . . . it's a good deal."

Charlie is chief pilot for Humble Oil Company, a member of the Texas Private Fliers' Association, and Veteran Pilot with three diamonds in his pin . . . holds every rating the CAA has to offer. And Jack Schweizer, the head of the Aviation Department for Humble, swears he's a wolf par excellence . . . which c-o-u-l-d b-e.

TONY HAGMANN

Enlist in your CIVIL AIR PATROL

Kansas City, Missouri

Former Air Terminal Manager Now Army Officer

Civil Air Patrol . . . While the Patrol is not permitted to practice with flour missiles dropped from the planes to simulate bombing conditions, the squads do include such maneuvers as sighting "enemy" troops. The "soldiers" are Boy Scouts who are working closely with the CAP squadrons. In addition to their flights, the Patrol is learning formation drill—on foot.

Improvements . . . The Civil Aeronautics Authority took over operation of the control tower at Fairfax Municipal Airport the latter part of March, supervising all air traffic in and out of the field. The towers at Municipal and Fairfax airports are separated only by the Missouri River and are now operated through telephonic connection by the same federal agency.

Convention . . . The Kansas City Unit of the Women's National Aeronautical Association was hostess to the National Convention in this city last month. The Hotel Phillips was headquarters for the streamlined convention which concentrated its activities into a two-day business session, with National President Marion M. Newell presiding. Both Miss Newell and Miss Frances Kypke, National Secretary, are Kansas Citians.

Visitors . . . A slightly demolished Messerschmitt 109 underwent close inspection for eight days when it was brought here from Tulsa and assembled in a tent at a downtown parking location. A crew of five from the naval reserve air base at Fairfax assisted in assembling the German plane. . . . DePaul University of Chicago sent its Dean Howard Egan and Dr. Richard E. Schnettler, professor of psychology, to TWA's headquarters to go over the educational ideas of airline work, with the idea of inaugurating a course in the co-educational university which would train young men and women for positions in the industry. . . . A timely visitor was the instructive brochure introduced to the city by its Chamber of Commerce. It was the brainchild of the aviation committee and the publicity department, and set forth the advantages which Greater Kansas City offers to those who desire air plant safety.

Women Pilots . . . Virginia Garth, a member of the Kansas City chapter of the Ninety-Nines, was selected by Miss Jacqueline Cochrane as one of the original group to start the training of a short refresher course somewhere in Canada prior to becoming a ferry pilot in England. Miss Cochran has been an instructor at the Jacobson Flying School on the Municipal airport, and is the first girl flyer from this city to go into foreign service as a pilot. . . . Another young instructor, Miss Jewel Stanton, member of both the Ninety-Nines and the Kansas City Unit of the WNAA, recently resigned her position with Kansas City Air College to become flight instructor at Spartan in Tulsa, Oklahoma.

Promotions . . . Charles D. Daily, former manager of the Municipal Air Terminal, is now a Major in the United States Army air force. Major Daily is supervisor of training detachment schools in the territory from Canada to Mexico and the Rockies to the Appalachian Mountains. He maintains his headquarters at the Missouri Aviation Institute, which is the U. S. Army Air Corps training detachment base on the Municipal airport in Kansas City. Another officer headquartered at the school, David B. Shirley, was promoted to a captain. Both promotions are retroactive to February 1st.

Miscellaneous . . . Refresher courses to prepare students as instructors and ferry pilots is the newest program introduced to Kansas City. Jess D. Green, regional civilian pilot training superintendent here, has application forms for applicants between the ages of 26 and 40, and reports that 700 applications have been received from pilots in this region. Upon completion of the training, the pilots must pledge themselves to apply for jobs as ferry pilots or instructors.

MARION MELCHER

Lawton, Oklahoma

Many Taking Air Corps Tests

Swain Airport—Lt. Robert Read, recently commissioned in the Marine Corps, has been home for a two weeks' vacation before reporting for duty in California. . . . Billy Paul Galyon is a new student and really loves to fly. . . . Elmer Sapp has been piling up a lot of hours since he soloed. . . . Milo Homenstine is helping at the airport now and is also learning to fly. He hopes to be as good as his big brother Kenneth who is an army flyer.

Quite a number of the boys are taking the tests for the Air Corps. . . Lt. George Knapp

Outstanding New Aviation Defense Books

COMMERCIAL and PRIVATE PILOTS: New "Aeronautical Training" fully covers new multiple choice examinations, with drift off course and alternate airport problems plotted and solution given. Commercial examinations are shown in separate section of the book. Navigation, Meteorology, Aircraft, Engines and CAR covered. Just published—12th edition only $3.00 postpaid, or C.O.D.

RADIO and INSTRUMENT FLYING: by Charles A. Zweng, Instructor, U. S. Air Corps. New 1941 Edition covering new important material. Written especially to prepare the pilot for government examination for "instrument rating." Radio-Telephone Permit included with Meteorology, Radio-Orientation, let-down, offcourse and alternate airport problems. Only $4.00, postpaid.

A. & E. MECHANICS RATING: Airplane and Engine Mechanics—Can you pass your written test? Send for new quiz book covering Airplanes, Engines, and Mechanics' Civil Air Regulations. 156 pages, fully illustrated, with new multiple choice examination questions. Only $3.00, postpaid or C.O.D.

FLIGHT INSTRUCTOR: A new quiz text covering the scope of the new multiple choice examination for flight instructor rating. Illustrated with diagrams. $3.00, postpaid, or C.O.D.

GROUND INSTRUCTOR: A new book, prepares for government examinations on Navigation, Meteorology, Aircraft, Engines and CAR. Why fail? Only $3.00 postpaid.

NAVIGATION PLOTTER: (Dept. of Commerce type) is necessary for all problems involving drift, letdown and offcourse, including alternate airport problems. May be used when taking examination. Complete with large leatherette Navigation Note Book and instructions, only $4.00 postpaid.

AIR NAVIGATION (Gold Medal Edition) includes meteorology, $5.00 postpaid.

SIMPLIFIED CELESTIAL NAVIGATION by P. V. H. Weems and E. A. Link, Jr. $3.00 postpaid.

U. S. COAST AND GEODETIC (Lyon)

AIRCRAFT COMPUTER with book of instructions. $3.00.

Order From

Pan American Navigation Service

Dept. SF

Metropolitan Airport, Van Nuys, Calif.

START FLYING . . . . . NOW

It's Patriotic! It's Fun!

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SUBSTANTIAL - - EXPERIENCED

☆ Retaining Our Leadership by Prompt, Efficient, Courteous Service. Buy the Easy Way—the A.C.C. Way. A Specialized Service to the Aircraft Industry. Contracts Insured and Purchased Immediately.

KEEP 'EM FLYING

AVIATION · CREDIT · CORPORATION

Love Field, Dallas OF ST. LOUIS Robertson, Mo.

and Billy Steddom soloed the 220 h.p. Laird. . . . Capt. Bruce Owen and Lt. Max Harding were out to do some flying. . . Paul Deaton made his first solo hop recently.

Municipal Airport—Mrs. Murray Gilbert, Fort Sill, became the first woman pilot at this airport to own a plane. Her ship is a black and red 65 h.p. deluxe Taylorcraft purchased from Gordon Evans, Mangum, Oklahoma.

Claude Ernest Misel, Fain Pool, Delbert Guisinger, and Lawrence Clopton, Jr., made their first solo flights last month. All are CPT students. . . . Dorothea Walker and Wendell Stephenson made a cross-country to Shawnee and Norman. . . . Bud Binning, an Air Corps cadet, was home visiting recently. . . . The Civil Air Patrol has been studying first aid.

MRS. THEODORE SWAIN

Enlist CIVIL AIR PATROL in your

Lubbock, Texas

Ninety-Nines to Meet Here

May 29-31—This is the date set for the sectional meeting of the Ninety-Nines, covering the eight states of Texas, Louisiana, Arkansas, Oklahoma, New Mexico, Colorado, Nebraska, and Kansas. We want especially to call attention to the fact that this meeting is for all women flyers of this area and not just the Ninety-Nines alone.

Lubbock was very much in evidence at Big Spring last month for the combination meeting of the Ninety-Nines, Civil Air Patrol, Texas Private Fliers and Texas Defense Guard. Approximately twenty planes landed in the stiff breeze down there at the Wintheiser hangout from Lubbock alone.

Ruby Lee Leary and Yvonne Fowler, the two Femin-Airs who have their private licenses, joined the Ninety-Nines while in Big Spring, and with the help of the other Femin-Airs attending the CAP meeting — namely: Nickey Moss, Helen Smyer and Mary K. Parks — chalked up a mark when they asked for, and got the next Ninety-Nines' meeting for Lubbock in May. Incidentally, this is the first time the Ninety-Nines ever have had a meeting in the Plains and Panhandle region. Don't forget that fact, girls, because Lubbock will be laid at your feet . . . and in case your 49½er is unable to be here, there are always the Cadets.

The Clent Breedlove Service is a busy place these days, shifting into high gear for the heavy demand for instructors for the Army. Solos, private licenses, and even commercials are lost in the shuffle as the word "Instructor" takes on more meaning and stands out as one of the most important things of the present situation. There are many vacancies among the familiar faces around the port, but new faces are constantly appearing and everyone is doubly intent on securing licenses and ratings.

Don't forget Lubbock in May, girls! The field is in fine shape and ready for you!

MRS. GENE FOWLER

Enlist CIVIL AIR PATROL in your

Mexia, Texas

Instructor Mathison Solos Four

The following solos were made under Instructor George Mathison: Marvin Rodgers, Bill Lasiter, Elvin Ferris, and Ernest Williams.

The Texas Defense Guard is quite active and practices formation flying every Sunday morning.

Dr. Stanley Cox, Louis Simpson, and R. J. Cardwell received their private licenses during the past month. Dr. and Mrs. Cox and Vess Taylor and wife made the trip to Big Spring for Dr. Malone's party and they report an enjoyable trip and a very nice time while there.

VANITA ROBERTS

—Photo by Bob Reed.

A sudden windstorm at San Angelo sent Gay Copeland's Stinson 105 tumbling into a fence after skinning down five fence posts.

Enlist CIVIL AIR PATROL in your

Oklahoma City, Oklahoma

Keith Kahle Awarded Jerry Sass Trophy

Keith Kahle, executive officer of the Oklahoma Civil Air Patrol and aviation magazine editor, has been awarded the Jerry Sass trophy for his outstanding contribution to state aviation during 1941. Presentation of the trophy was made at the annual dinner-dance of the Oklahoma City Aviation Club. Moss Patterson, state wing commander of the Oklahoma CAP, was toastmaster. Ed L. Traylor, president of the club, made the presentation.

Several members of the Oklahoma City Unit of the Women's National Aeronautical Association attended the national convention held in Kansas City, Missouri, last month where ideas and experiences were pooled for the purpose of preparation for the "all out" war effort. Women in aviation are gearing themselves for new responsibilities and greater loads in many divisions of defense work. *Remember Bataan!*

MRS. B. D. SPONHALTZ

Enlist CIVIL AIR PATROL in your

San Angelo, Texas

Hurricane Wrecks Three Planes

Bob Farmer and Guy Lavender have received their private licenses. . . . Doyle Lane, Veribest, is instructing at Coleman in the primary training school. He recently returned from Ft. Worth where he has been taking special training for the past month. . . . Rex Sikes, instructor here for a while, has taken a position instructing at Huntsville, Texas.

Gay Copeland and Le Roy Johnson are taking flying lessons at Ft. Worth under a new program. It will take approximately six weeks to finish the course, and when finished they will be able to give flight tests and teach advanced CPT courses.

The city of San Angelo has leased our present municipal airport to the army for defense training. Construction on the Army School is to start as soon as contracts are let. Rumors are out that the new school will use twin-engine ships. This new field will give San Angelo two training schools for the army—a basic and an advanced.

Winds of hurricane force swept away four of our privately owned ships and damaged another at the airport recently. The ships destroyed belonged to Gay Copeland, Dr, O. L. Parris, West Texas Flying Club, and the Jaycee Flying Club; the San Angelo Flying Club's Cub was damaged. The wind came up suddenly and the damage was all done in a few minutes. The small administration building was blown over, and Joyce Therwhanger, who had returned to turn off the lights, had a close call when the structure toppled.

Due to the accidents at the airport and the taking over by the Army scheduled for the near future, our field here will be closed until another one is designated and cleared, which we hope will be by the first of June.

A CPT class will probably start here in June, Airport Manager Gay Copeland states. The San Angelo Junior College has not had a class for a year, and Mr. Bare and Dr. Elkins are looking forward to a large class when the program reopens.

The new airport will make San Angelo second only to San Antonio. Cost of the new school is expected to be approximately $5,000,000.

JOYCE THERWHANGER

Enlist CIVIL AIR PATROL in your

Shreveport, Louisiana

Tacey-Badgett Opens for Business

Municipal Airport—Good news to all pilots who pass through Shreveport is the fact that all the trees around the airport have at last been cut down. In fact, you now can see the trains on the side of the Benton Road from the terminal building. The old field is really looking good, with runways and taxi strip completed.

Yes, there are many improvements—including the new airport truck, a 1939 Chevrolet. It's initial "flight" to the center of the field was made when Cadet Lakey from Terrell, Texas, ground-looped on the runway when landing. After having his injured finger bandaged he left in another AT-6 with his flight captain. Everyone was glad so little damage was done—there has, to my knowledge, never been a fatal accident on this field, and it is sincerely hoped there never will be.

The Tacey-Badgett Aviation Company has set up business in the hangar, with James M. Ryan as manager and Jane Nicholson as secretary. Badgett Flying School had a change of apprentice-instructor classes, with Levon Firestone of Seminole, Oklahoma, Marvin Stafford of Fort Worth, Hal Slack Browning of Ada, Oklahoma, John Herbert Cowser of Arcadia, La., and Toby Adair and James Brewer, both of Shreveport, as the outgoing class. Members of the new class are Perry Seddon of Hollis, Oklahoma; Luther Hardin of Conway, Ark.; Robert Bradford of Little Rock, Arkansas; and Paul Hardy, William S. James, and William C. Dudney, all of Texarkana. James Abney received his private license and Bill Gooch and Randolph Marston their commercial licenses recently. They give high praise to Claude Hamel for his wonderful coaching. Robert McBride Lewis' first solo student was Mrs. Mildred Carney (better known as "Sweet Pea").

Everyone has taken to motor bikes, service cycles or motorcycles since the rubber shortage. Willis Young is seen riding a motorcycle frequently, but George Hearne, Bobby Emery, and Cotton Jeter prefer service cycles. It is rumored that Walter Robinson is to be married soon, while there may be something to that Army bracelet that very attractive Mary Sylvia Herrin of the Chicago & Southern Airline office is wearing. "Red" Nicholson of the CAA Communications is right where he belongs—in a cage. David Wheeler of the

weather bureau has changed shifts, from night to day—bet he's glad.

The Civil Air Patrol is progressing steadily with its training program. About 36 of the members here have completed their Red Cross First Aid Course, while more than that number have had the lectures on military training and courtesy, and are busy drilling. David Goebel is in charge of a group at Mansfield, which is included in our squadron.

Stovall Field—Cliff Stovall now has three new instructors: Roy Phillip James; Hugh W. Bishop from Denver; and James C. Moore from Italy, Texas. Formerly instructors at this field, Ollie Day is now an advanced instructor for Les Bowman at Fort Worth, and Gladney is with Finefrock at Tyler, Texas. Cliff Stovall keeps "on the hop" most of the time.

MARJORIE HARDMAN

Enlist in your CIVIL AIR PATROL

Tulsa, Oklahoma

Women's Air Corps Gets Charter

Before we start jotting down our bit of happenings around the airports, we want to tell the Texas people how swell we think they are. Up here in Oklahoma, we have always kind'a thought that all "the pilots" were right here, but we see the Texas people think they are "deep in the heart of Texas", and after attending the recent TPFA meeting in Big Spring, we really think they have something.

Big Spring flashes—Mrs. Art Wintheiser proudly wearing the cowboy hat that was autographed by practically everyone at the dance the night before . . . listening to Kenneth Burke raving about his student, Mrs. A. Guiberson . . . seeing Tulsa's CAP commander, Bill Green, for the first time in uniform . . . Tony Hagmann, dashing around in an adorable tan suit with perk cap to match . . . so nice seeing Ralph Wood, from Tulsa, who is now instructing in Wichita Falls and is called "pappy" by his students . . . not recognizing Dick Simpson after his change from cowboy to street clothes . . . meeting Harold Byrd, CAP wing commander for Texas . . . more thanks to Dr. and Mrs. P. W. Malone for the wonderful party . . . the thrill of having a glimpse of the North American plant on the way to Big Spring by train . . . meeting such grand people as Mr. and Mrs. Good, who have the ranch adjoining the Simpson ranch . . . the good coffee they serve at the Settles Hotel.

At Spartan School—Jewel Stanton, from Kansas City, Missouri, has been added to the staff of instructors for civilian students. Jewel is Spartan's third girl instructor . . . the others were Mrs. C. R. K. Johnston and Grace Stevenson.

The following have passed their flight test for instructors' ratings: W. G. Leroy, James Graham, William Bates, Lestie S. McMillin, and George Coleman.

Harvey Young Airport—The twenty young men recently selected as members of the Tulsa squadron for elementary pilot training preparatory to entering the Army Air Corps have all received their new uniforms and insignia, a gift from the Tulsa Aviation Development Association, which is sponsoring the group.

Commercial Airport—Traffic had better slow down on the road to the airport, as Manager Johnny Armstrong has just finished the paint job on Corinne's buggy . . . some buggy, too . . . we bet she could make money selling rides in it.

Two girls doing a lot of flying these days are Betty Whitlow and Margaret Ann Hamilton . . . Harry Frye and Jay Miller are taking the Government Instructor's Refresher course at Spartan.

Women's National Aeronautical Association—New officers are: Mrs. Chester Bleyer, president; Gayle Horrel, vice president; Mrs. George D. Childers, treasurer; and Mrs. O. A. Steed, secretary.

The Tulsa Women's Air Corps have received their charter, and a charter membership party is being planned . . . they are now flying at Commercial with Tulsa Flyers Club.

Girls who are going to the WNAA national convention in Kansas City include: Helene Flippo, Doris Dorney, Madge Bleyer, Hazel Brown, Gayle Horrell, Pat Campbell, Peggy Toomey, Mary Ellen Wyatt and her mother, and Mrs. Claud Wentworth.

JONNIE LAIRMORE

Enlist in your CIVIL AIR PATROL

Wichita Falls, Texas

Wichita Engineering Doing Training Job

On tour with Tony—At "Army" Armstrong's outfit you can find the greatest number of flying officers and men having chow between the hours of dawn and sunset. He has the big ole Army next door . . . they use the same field 'n stuff . . . good looking young lads.

Inspector Ravenstein from Fort Worth met Ralph Woods, Buster Carey, R. J. Russ, Tony Ross, and "Radio Joe" Martin out at the field and held a meeting on the advisability of having the flight check girls, Juanita Ingle and Freda Ward, write up their fan letters and purchase orders on cokes because they have so much time left over every day . . .

FORT WORTH AVIATION SCHOOL

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THURSTON AIR WING FABRICS

GOING CROSS COUNTRY?

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In Texas it's a long way from border to border. Stop in Fort Worth (out where the West begins)—get your 100-hour aircraft inspection and a radio frequency check. You are invited to use our completely equipped shops.

Civil Air Patrol members—make this your headquarters!

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all they do is sit around and write anyway . . . what the hen! . . . somebody ought to "keep 'em busy!" Shorty Schwalbe, the chief fixer-upper, and Bettis, the weather man, took exception and said they'd write their own purchase orders. But "Tank" Horton who used to be with the Phillies as a ball man, and Carl Palmer, both looked aghast at this bit of business and hied themselves off to the coffee shop to join Jo Long in a cuppa stuff.

Lynn Trigg, Don Hanson and Jimmie Ward sat down and watched the dodos doin' eights for the inspector. . . . Jimmie said "hi!" to Houston. . . . CAP is getting the job done. . . . Les Stringer called his main sparkplug, Joe Cable "to meetin'" and joined Mrs. Jimmy Kolp, Gene Harvey, H. I. Coggins, Herman Barrow, and C. Y. Gorman (who has a pair of airplanes) in a little ground work by Mr. Moore.

Wayne Parnell and Earl Kuntz are the best observers the CAP has in the Wichita Falls area . . . they really get the work turned out, and my holy hat — the problems they figger.

Flash—D. H. Bolin who heads up the Wichita Engineering Co., has a training school which is a deluxe job . . . he has gals and men over the draft age training to handle the defense jobs in the aircraft factories . . . they are really learning it from scratch.

Sam Coffman over at Commercial airport is whipping out private pilots and has lots of CAP activity. . . . Quite a trip . . . got snake bit . . . 'bye now!

TONY HAGMANN

FOR SALE: LUSCOMBE SILVAIRE. Only 81 hours total time. Perfect Condition. Reason for selling: going into military service. Will sacrifice for $1990. Ship now hangared at Waco, Texas, Municipal Airport. Dr. Stanley Cox, Groesbeck, Texas.

FOR SALE: 1940 BL 65 TAYLORCRAFT, like new, $900.00. Write Box 750, Southern Flight.

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PINS and LAPEL BUTTONS
ACTUAL SIZE

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BY MAIL—POSTPAID—TAX INCLUDED
10K Gold ..... $3.00 Sterling $1.40
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FORT WORTH, TEXAS

TPFA News Log

Big Spring Meeting State's Largest

Stamford, Wichita Falls and College Station on Calendar

The Big Spring chapter of the Texas Private Fliers Association takes top honors for providing the largest meeting in recent years, with approximately 100 airplanes and 350 guests accepting the cordial invitations from Doc Malone and the good citizens of Big Spring on occasion of TPFA's annual chuck wagon party, April 11 and 12.

Highlights of the week-end celebration were the chuck wagon barbecue on the Dick Simpson Ranch, followed by a dance at the Settles Hotel, Saturday night, and the Texas Private Fliers breakfast meeting Sunday morning. Cooperating with Doc Malone and Dick Simpson in making the meeting a success were Jimmy Green of the Chamber of Commerce and Mr. and Mrs. Art Wintheiser, operators of the Big Spring Airport.

At the general meeting Sunday morning, members voted to accept invitations to visit Stamford and Wichita Falls in May and June, respectively. The Stamford meeting will be practically a "homecoming" meeting since that city was host to the first organizational meeting of TPFA. Dates are May 23 and 24. General Chairman Roy W. Arledge urges all members to wear cowboy regalia if possible and to come prepared for a real ranch-country celebration.

The Wichita Falls meeting scheduled for June will be directed by Les Stringer, well known cattleman and sportsman pilot. Dates will be set for the Stamford meeting.

TPFA has also received a special invitation to attend the Texas Aviation Week celebration at A. & M. College, June 22 through June 27. Saturday June 27 has been designated as Texas Private Fliers day and elaborate plans are being made to celebrate the occasion, college authorities advise. Governor Coke Stevenson has officially proclaimed the week and hundreds of aviation leaders from all over the nation are expected to attend the conferences and other activities being planned for the week.

Pilots Urged to Assist CPT Instructors Course

Ed C. Nilson, Fourth Region CPT Superintendent, speaking before the TPFA meeting at Big Spring April 12, invited the support of all members in finding candidates for the instructor refresher course, now being processed to turn out 2,000 instructors in sixty days from the ranks of private fliers.

"Uncle Ed" pointed out that there were many capable pilots working in all sorts of jobs and professions who would be far more valuable to the war effort holding down an instructor's job than in some of the non-essential positions they now fill. "The Air Forces Training Command has called on us to provide these instructors by July 1," Nilson said. "It is up to folks like us to pass the word around and personally see to it that every possible candidate for this important course knows about it and places his application."

Civil Air Patrol Wing Commanders of Texas, New Mexico, Oklahoma, Arkansas and Louisiana went on record in support of the canvass to find enough material to fill the quota in the Fourth Region. Application blanks were printed by the Texas Wing of the CAP and distributed throughout the Southwest.

TDG and TPFA members likewise went on record in support of the program and assured Nilson they would leave no stone unturned in the search for competent instructor material.

CALLING ALL PILOTS!

Uncle Sam wants pilot instructors.

If you are between the ages of 21 and 42, if you hold a pilot's certificate and have over 140 hours of solo flying, your country needs you.

The Army Air Forces Flying Training Command has asked for 2,000 new elementary and secondary instructors to work in the training schools conducted by the Air Forces and the Civil Aeronautics Administration, and to produce new pilots.

You bring your certificate, your flying experience and your flying skill, and the CAA will give you a refresher course to fit you for this work.

It is a good job, too. You start at not less than $200 a month, and the average pay is $300.

Phone or write your nearest CAA representative, who will send you an application blank.

As a pilot, think! Are you more important in your present job, or in the air?

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AIRCREDIT INC.
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Southwest pilots prefer
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PROCLAMATION

BY THE

Governor of the State of Texas

TO ALL TO WHOM THESE PRESENTS SHALL COME:

The State of Texas has become a focal point of military and civilian aviation training, manufacture and maintenance in the United States.

The Agricultural and Mechanical College of Texas has made aviation history in the rapid development of its Department of Aeronautical Engineering to an enrollment of five hundred Students in less than two years.

This College through its School of Engineering is chief sponsor of a series of conferences centering at College Station of all agencies and persons interested in the many phases of airplane manufacturing, flight training, model airplane building, air transport, airport construction, maintenance and operation. The principal co-sponsor is Southern Flight, the only magazine in the Southwest devoted wholly to aviation. Other participating agencies include schools and colleges, manufacturers, operators, engineers, statewide aviation groups, model airplane clubs, civic groups and luncheon clubs. The program is to be statewide.

Therefore, by virtue of the authority vested in me, I hereby proclaim the period of June 22 - 27, 1942, as

TEXAS AVIATION WEEK.

All interested agencies and individuals are called upon to avail themselves of the great opportunity of participating in Texas' First Aviation Congress.

IN TESTIMONY WHEREOF I have hereunto signed my name officially and caused the Seal of State to be affixed hereto at Austin, Texas, this the 28th day of April, 1942.

GOVERNOR OF TEXAS

SECRETARY OF STATE

TEXAS AVIATION WEEK

June 22 to 27, 1942

A series of conferences at TEXAS A. & M. COLLEGE

The expansion of the Aviation Industry in mid-America focuses national attention on the problems and developments related to

WAR EFFORT

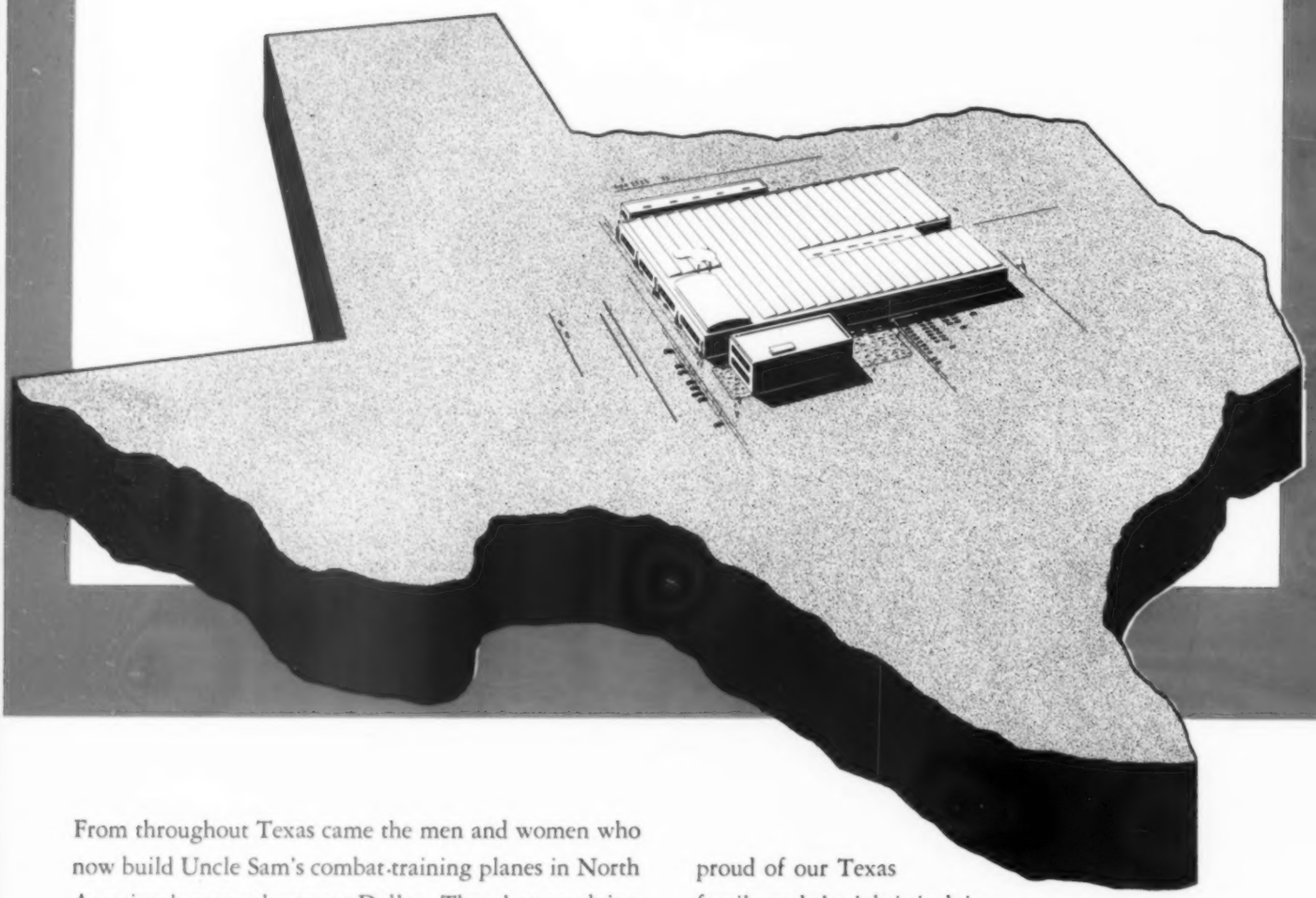
Factory Training—Production—Subcontracting—Public and Press Relations—Flight Training

HEADLINED BY OUTSTANDING SPEAKERS FROM THE RANKS OF THE NATION

For further information address: Dr. Howard W. Barlow, General Chairman, Department of Aeronautical Engineering, Agricultural and Mechanical College, College Station, Texas

TEXANS ARE BUILDING AIRPLANES

95% of the Employees of North American's Dallas Plant are native Texans



From throughout Texas came the men and women who now build Uncle Sam's combat-training planes in North American's great plant near Dallas. That they are doing a grand job will be attested by any flying cadet at the nation's great advanced training centers.

Already North American's Texas plant has taken an important place in America's mighty war effort. We are proud of our Texas family and the job it is doing – each man and woman at his new found task, a new industry under the Texas sun.

Texans have the real American spirit, the kind of stuff that "will and must" win this war.

BUILD AND FIGHT WITH *Teamwork* – THE NORTH AMERICAN WAY

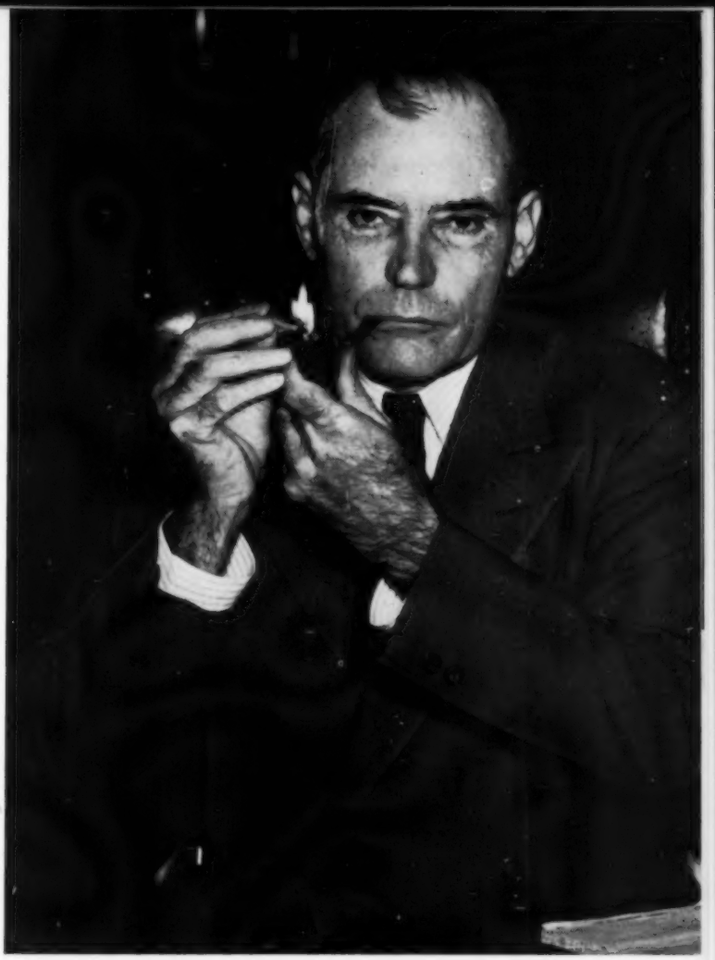
NORTH AMERICAN AVIATION, INC.

DALLAS, TEXAS

TEXAS *and* AVIATION

A Message to the Industry

By **COKE STEVENSON**
Governor of Texas



THOSE OF US in Texas whose memories extend back to the first world war cannot fail to grasp the bitter significance of this present life-and-death struggle between the United Democratic Nations and totalitarian aggressor nations.

Years ago, prior to 1917 and declaration of war against Germany, our Canadian brothers came to Texas and established their great flying fields. Subsequently, when we went to war, our own Army likewise chose Texas soil for air training bases and Texas has never relinquished her position as the aviation training ground of the nation.

Today, scores of flying fields again dot the map of Texas, many of them on the very ground used in the first world war. We are re-living on a greater scale what we experienced twenty-five years ago. Every man, woman and child appreciates the part the modern warplane will play in this tremendous duty before us.

Again, Texas is turning her manpower, her industry and her genius to the full task of *offensive war*. Once again the Canadian and British boys are back with us on Texas flying fields; and again, Texas skies are filled with the encouraging sound of trainers turning out wave after wave of military airmen who soon will spell the doom of Axis aggression.

But just as the part airpower is playing in this war far surpasses its role in the last war, so does the part Texas is taking in the present struggle for air domination far eclipse the contributions of our great State in 1917 and 1918. Today the most modern factories in the world have brought the battle of producton to Texas soil. We are proud of them.

Likewise, scores of old and established factories and hundreds of smaller manufacturing plants and machine shops either are in the process of conversion or are now busy with airplane subcontracts. Texas agriculture, the great reserves of natural resources, including sulphur, iron and steel, magnesium, copper, and the world's greatest supply of oil and natural gas, Texas' fine educational and research institutions, the wealthy supply of vigorous, native Texas labor, the splendid rail, highway, water and air transportation facilities throughout the state, her adequate supply of electric power, her friendly terrain and climate—all combine to provide a natural setting for the manufacture of aircraft and associated products.

The State of Texas cordially invites the aviation industry to consider location of factories or branches within the State and to investigate the facilities in Texas for subcontracting. The great resources of a friendly State are yours for the asking.

The facilities of our research bureaus are available for assembling data required by those interested in entering this attractive field and I shall be glad at any time to hear from members of the aviation industry and give them every assistance which the State can render.

PLYWOOD AND PLASTICS . . . A TEXAS "NATURAL"

In the Lone Star State Are Abundant Woods, Chemicals and Agriculture for Planes

By VICTOR H. SCHOFFELMAYER

THE steady trend towards new structural materials—plastics, plywood and others—to replace such critical metals as steel, aluminum, magnesium and certain alloys, is destined to have important effect upon the American airplane industry.

Like all other machines airplanes are the product of constant evolution, in which design, structural material and functional objectives are blended into a unified whole. Just as the automobile of today only remotely resembled the "horseless carriage" of thirty years ago, the airplane of tomorrow is likely to differ greatly from the flying machine of Bleriot's day or even the marvelous models of the present.

NAA Blazes Way

Since lightness, without sacrifice of strength or flexibility, is an essential of any flying machine heavier than air, it stands to reason that the newer materials, developed through the application of synthetic organic chemistry and of physics to plant and animal products, such as plywood or chemurgized lumber, will appeal to the engineers who design and build airplanes.

Plans for commercial production of plywood planes for training purposes at the huge plant of North American Aviation, Inc., in Texas, and the building of various other types of war planes from wood and plastics, mark the beginning of what is likely to become a wholly new, basic industry eminently suited to further development in Texas and other Southern states having abundant raw materials, principally forests, such basic chemicals as salt, sulphur and petroleum, natural gas, lignite, magnesium, limestone and many others.

The unfortunate words—Ersatz and substitute—have done more to hold back the logical development of the plastic airplane than perhaps any other factor. There are many reasons why the modern airplane should embody the new research and discoveries which have launched the Chemurgic Industry on its sensational way. The harmonious fusion into wholly new structural materials of such abundant supplies of cellulose and lignin, starch and sugars, the casein of milk and the protein of soybeans, the strong fibers of ramie or hemp and the still more powerful synthetic resins made from Urea and formaldehyde or vinyl acetate, constitute a challenge to the airplane engineer, as they do to the automotive engineer, the architect and general builder.

Vast Resources Waiting

We are rapidly entering a great Chemical Era, which will give direction to the Machine Age along new lines little dreamed of a dozen years ago. Science and experiment have broken down the prejudice of centuries. New chemurgic materials are no longer looked upon as substitutes—implying something inferior. Rather they are rapidly replacing long established materials because of their superiority, their ready availability and ease of replacement. Chemurgic raw materials, such as resins, gums, waxes, synthetic varnishes and blending materials, can be combined by the chemist and physicist into structural matter stronger and lighter than steel. Because Nature can produce cellulose and lignin, starch and other organic chemicals year in and out, Texas chemurgic materials occupy an enviable position in modern industry.

The varied, vast natural wealth of Texas and the South, possessing the largest timber reserves of the nation to supply cellulose and lignin for plywood and plastics, the largest concentration of sulphur, petroleum and natural gas, great deposits of salt and limestone, ability to raise every crop known to the temperate and subtropical zones, a growing season of more than 220 days—all these assets point the way to new enterprise, in which aviation will play a leading part.

The South, with its mild climate, offers year-round working activities in field, forest and factory. It is the logical place for a great aviation industry, using the combined mineral, metal and plant products of the region in accordance with the new technology.

Magnesium on Coast

Especially is the Western Gulf Coast Region of Texas and Louisiana suited to the maintenance of large airplane factories — drawing their basic materials from nearby forests of gum, cypress, oak and pine, their chemicals from the sulphur and salt beds along the Gulf of Mexico, their iron and steel from the great beds

(Continued on page 44)

Wood compositions may soon utilize precious forest wealth now going into waste heaps.

MR. MANUFACTURER:

—CUT THIS CAKE to Fit YOUR Needs!

You can pin your faith in Texas . . . Every Texan is in this war until it is won.

- ★ More than 100,000 square feet under roof to serve as plant housing — or as a springboard to an industrial giant-to-be.
- ★ Adequate siding and highway facilities with expansion in any direction for structures or fly-away field.
- ★ Plentiful supply of intelligent, native labor.
- ★ Close in location with all utilities connected for volume delivery.
- ★ Now in operation as a CAA approved mechanics school and repair depot.

WHATEVER your industrial needs may be, we at Wichita Engineering Company will do everything possible to assist in utilizing our plant and acreage to speed conversion to war production.

Blue prints and descriptive material are available. You will find our organization and the people of Wichita Falls fully co-operative and anxious to assist in every possible way. If you wish to speak freely, but in confidence, call our president direct by long distance telephone. Just ask for D. H. Bolin.

Wichita Falls is about 400 miles inland from the SAFE Texas coast and is an important center of manufacturing for the oil field industry

SAVE TIME!

Telephone FOR DETAILS

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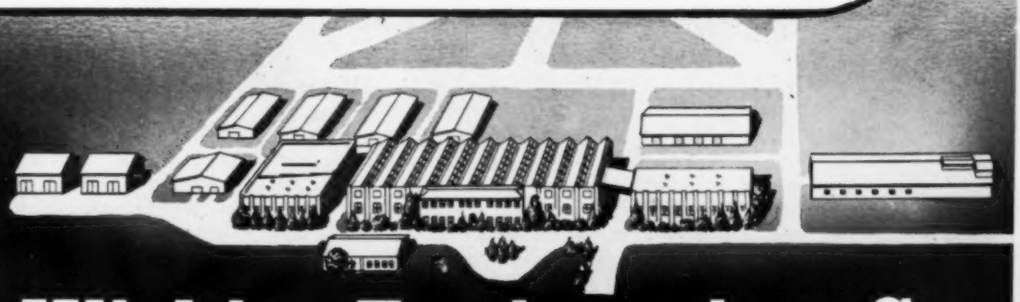


Wichita Engineering Co.

P.O. Box 990 ★ WICHITA FALLS, TEXAS

PLYWOOD AND PLASTICS

(Continued from page 42)

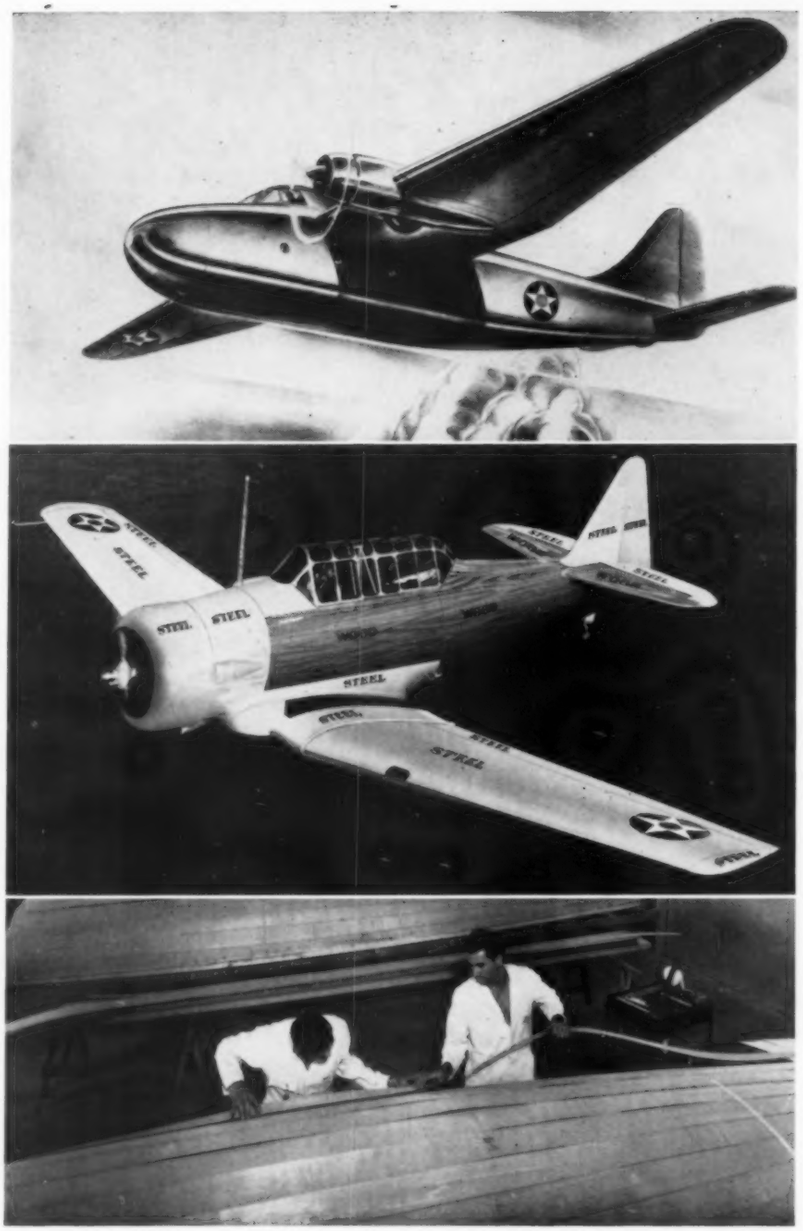
of surface ores which cap the range of hills deep in the East Texas piney woods, their magnesium from the sea water along the coast, and other basic materials from elsewhere in the South.

The layman, thinking only in terms of the past, may not know that new techniques developed at the U. S. Forest Products Laboratory at Madison, Wisconsin, make possible the conversion of slabs of ordinary waste wood into a moldable material, which can be pressed into practically any desired shape. After once shaped to a pattern the wood becomes hard and tough, does not change its shape, resists decay and bids fair to hold its place alongside of metals.

Those who have seen the water-clear, glass-like noses of modern war planes, fashioned of a transparent plastic, will not doubt that we are rapidly nearing the stage when airplanes in their general structure will employ suitable plastics, whose origin may be either wood, salt, limestone, coal or various combinations of these materials. Chemurgy is changing our thinking and our industrial practices every day.

The beginning made at North American Aviation, Inc., near Dallas, when plywood was used to save 450 pounds of aluminum in trainer planes, will most likely lead to further substitution of lighter materials — for after all, the lighter a plane is the greater the pay load it can carry, a most important essential either in peace or war.

It is only necessary to keep up with technical achievements in the airplane industry in the last year or two. Langley Aircraft Corporation, Crosby Aircraft Corporation, Curtiss - Wright, Timm and others are now deep in experiments to perfect the plastic plane.



Native materials should encourage great use of local wood and plastics in Texas. Of three planes shown here, only one is Texas built. It is the North American trainer in center photo, but its wood is imported from Michigan. At top is the giant new Curtiss Army cargo plane built of wood and other non-strategic material in Kentucky—just announced and the latest type to employ wood. Bottom photo shows workmen in first step of Timm fuselage construction as they employ strips of spruce veneer, cut to shape under steel template and laid lengthwise over wooden form.

Why Wait Longer?

Greatest credit, however, belongs to Harry Atwood, American pioneer in the field of milk casein research, in developing a bonding material which makes possible the structural union of thin veneers of various woods into light, flexible, tough material equal for practical airplane building to aluminum or steel. Heat and steam contribute pliability in fitting the ply to the proper form.

Water-resistant, fungus-proof urea resins are other materials which bond together veneers into durable structural material, but in the writer's opinion the most likely material, all things considered, will be the pieces of oak, gum, pine, spruce, redwood or whatnot, which mild acids and pressure and heat will convert into moldable form, ready to be used much in the same manner as more costly plastics or metals.

Perhaps cellulose-lignin chemurgic techniques will set up vast new industries, converting the thousands of piles of sawdust waste and sawmill trimmings (now burning night and day throughout our lumber areas) into pliable, ready-to-hand raw material. By controlling heat and pressure this new material can be fitted to any required pattern, needing only to be reenforced with metal ribs or other supports at critical points.

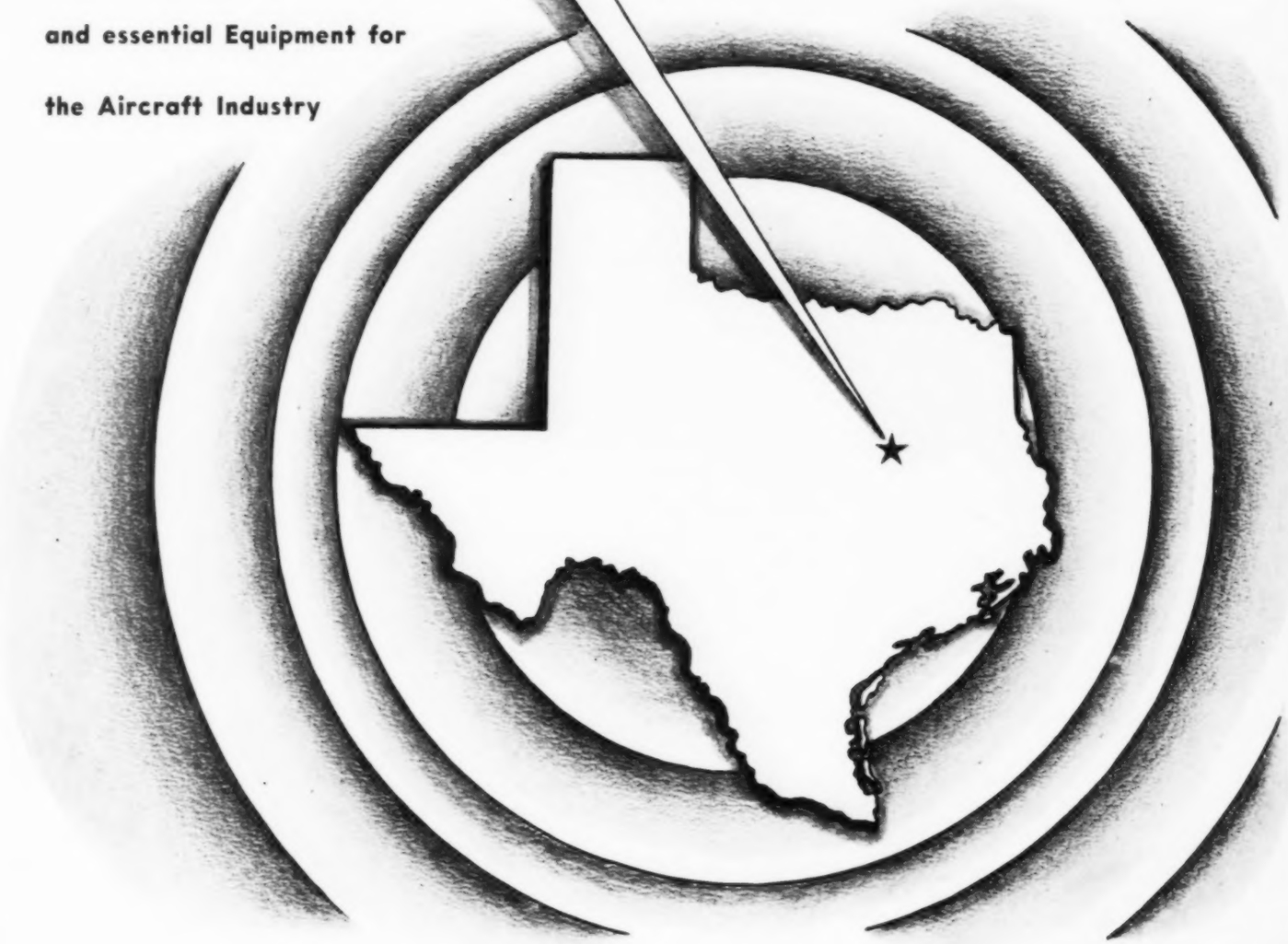
Who needs further elucidation of the challenging possibilities in the airplane field when its technicians take advantage of the South's great store of waiting materials of organic origin, which will release iron and steel, aluminum and copper, and in the end enable the building of stronger, faster planes to meet the demands of either war or peace?

TEXAS. . . *All Out for Aviation*

with THE AIRCRAFT STEEL & SUPPLY CO.

Suppliers of Steel Tubing, Bar and Sheet, Fabric and Finishing Materials, Control Cable, Instruments, Hardware, and essential Equipment for the Aircraft Industry

With branches and offices in five key cities of Mid-America, we are supplying the expanding needs of the vital aircraft industry with true AIRCRAFT efficiency. Our large and growing facilities for service are located to save time and speed production.



THE AIRCRAFT STEEL & SUPPLY CO.

WICHITA, KANSAS

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Aeronautical Students at Texas A. & M. Solve Their Problems with a Laboratory Wind Tunnel

By BYRON WINSTEAD

TEXAS A. & M. College long has been known as the nation's largest military school and if present progress continues, it soon will have the largest school of aeronautical engineering in the United States. Beginning in the fall of 1940 with an initial enrollment of 300 students, the department has grown to nearly 500 to date. A complete curriculum in aeronautical engineering is now being given, and the present senior class of 33 members will graduate in June with the first degrees in aeronautical engineering ever conferred by a Texas institution.

Texas A. & M. College invites the industry to call on it for assistance.

Practical Professors

The department was created through the efforts of Gibb Gilchrist, Dean of the School of Engineering, who foresaw the growth of aviation in the Southwest and the need for training our young men for useful careers in this important industry. The activities of the department are under the direction of Dr. Howard W. Barlow, who has been actively associated with the aeronautical industry as teacher, consultant and engineer for the past 18 years, and who is assisted by an experienced staff of well qualified men.

Aerodynamics and aerodynamic research are handled by Professor Robert M. Pinkerton, who for 12 years was research aerodynamist at the Langley Memorial Aeronautical Laboratories of the National Advisory Committee for Aeronautics. He joined the Texas A. & M. staff in December, 1941.

E. J. Lesher, formerly of the structures section of the Douglas Aircraft Corporation, is the specialist in structures.

P. R. Higgins, formerly of the Boeing Airplane Company, is in charge of work in navigation, meteorology, and flight test engineering.

Specialists from other departments of the college including Dr. A. A. Jakkula of the Civil Engineering Department and William I. Truettner and Frank B. Chapman of the Mechanical Engineering Department give special work in structures, aircraft engines and air transportation subjects.

Three Semesters Annually

The curriculum which leads to a degree of Bachelor of Aeronautical Sciences upon the successful completion of eight 15-week semesters was developed as a result of the experience of the members of the faculty combined with the recommendations of the aeronautical industry.

At present, as a war time speed up measure, the college is on a three semester per year basis which permits a student to receive his degree in two and two-thirds years instead of the four years previously required.

No short cuts which would limit the education of the prospective engineer have been permitted in the course, and the quality and thoroughness of the work have been recognized by the aeronautical industry. Every senior who graduates this year has received several offers of employment from leading aircraft manufacturers.

In addition to the conventional courses in English, mathematics, strength of materials and drafting, several courses have been established at the express request of the aeronautical industry. What is believed to be the only college course in aircraft flight test engineering was established in the fall of 1941 for senior students, where in addition to ground work, all students participate in obtaining test data in flight in a modern, high-powered airplane. A course in Aircraft Detail Design is made available for men who contemplate immediate employment in the design offices of aircraft companies.

First Texas Wind Tunnel

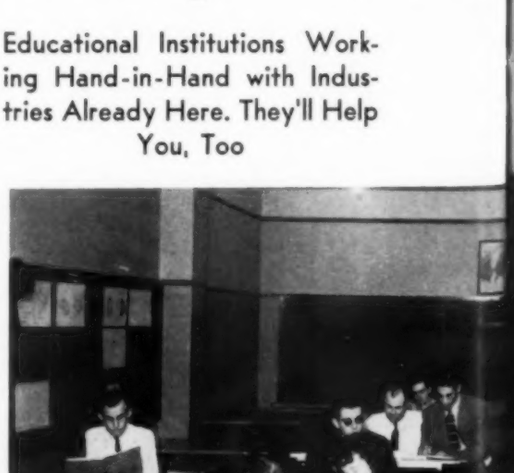
The first wind tunnel in Texas is located in the department laboratories and has been operating for more than a year. This tunnel is capable of testing airfoil and airplane models at a speed of about 100 miles per hour and is used for testing and research work. It has a throat 24″ x 36″ and may be used for three dimensional as well as two dimensional problems.

The equipment of the laboratory has been selected with the object of making it available for research as well as teaching. Equipment and apparatus are provided for navigation, meteorology and instrument courses, and the school has been given the highest possible rating by the Civilian Pilot Training Service for teaching these subjects. Strength testing equipment is available for investigation of

(Continued on page 48)

TEXAS C
Busy With A

Educational Institutions Working Hand-in-Hand with Industries Already Here. They'll Help You, Too



s COLLEGES
h Aeronautics

Texas U. Was First in U. S. to Join the Office of Education to Give Defense Course. Below Is Typical Class

By M. J. THOMPSON

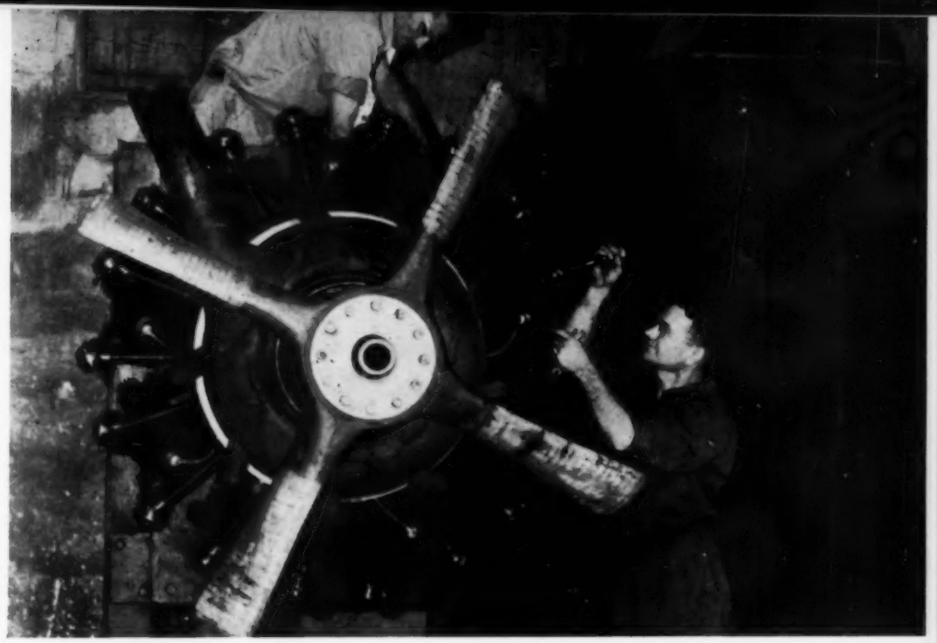
THE University of Texas has demonstrated its utility in the war effort by constantly expanding its aeronautical engineering program to serve the growing aircraft industry in Texas and elsewhere. In all the nation the University offers the only full-time, comprehensive defense course in aeronautical engineering in co-operation with the United States Office of Education.

Directly linked with the aircraft industry is the University's program of part-time courses for workers and prospective employees of airplane factories in the Dallas-Fort Worth area. Over 20 classes in seven different courses are under way with more than 400 persons enrolled.

Helps Industry

Similar training under university sponsorship is immediately available for other aircraft manufacturers who may come to this area.

Aeronautical activities at the University of Texas are actually of long standing and have a particularly interesting and impressive history. During World War I, a School of Military Aeronautics was set up on the campus in co-operation with the Army Air Corps and a large number of pilots received their training here. Many of these men are still with the Air Corps where they have risen to high rank and now hold positions of great importance.



Here's One of the Test Stands at North Texas Agricultural College. It Opened Aero Course in 1930

In the engineering field, aeronautical training was first offered at the University in 1926; and around 1930, a number of students were graduated from the Department of Mechanical Engineering with special work in aeronautics. This program became somewhat inactive during the lean years of 1930-33. From 1933 to 1941, elective courses in aerodynamics and airplane structures were offered.

Early in the year 1941, the University decided to expand its aeronautical engineering program and announced the creation of a graduate program leading to advanced degrees in this field. This work continues to form a part of the activities of the Mechanical Engineering Department. After a careful study of industrial requirements and the programs of other colleges, it was decided to emphasize the graduate field of aeronautical engineering because of the basic need for engineers thoroughly trained in fundamental principles of applied science and engineering. The generally recommended policy of providing fundamental training before specialization was also given a good deal of consideration in determining this policy. Finally, the outstanding position of the University in research in the Southwest made it particularly desirable to emphasize this phase of aeronautical engineering training.

Building Wind Tunnel

This program now available admits engineers with Bachelor's degrees and basic training in Mechanical, Civil, or Electrical Engineering. Courses covering detailed work in aerodynamics, airplane structures and stress analysis, propeller theory and design, aircraft engines, and the application of this basic work to both general and detailed airplane design, are now provided in the program. Laboratory equipment for research work in the various phases of aeronautics is now being planned. Construction work on a small wind tunnel has already begun. This tunnel will have a test section 36 by 22 inches and an estimated wind speed of 150 miles per hour. Special design features incorporated in it will make it particularly adaptable to research on problems of skin friction and resistance and turbulence which are of such great importance in the design of high performance aircraft. Plans for the development of research work in aircraft structures and engines are already under consideration.

The graduate program in aeronautical engineering, as now set up, calls for 45 hours of advanced work, including a considerable amount of time devoted to original research and development. Supplementary courses in advanced mathematics, applied mechanics, metallurgy and materials, and industrial engineering and management serve to round out the program. Completion of this work leads to a Master's degree in aeronautical engineering while further advanced study and research leading to a Doctor's degree may also be undertaken.

At the present time, a portion of the aeronautics work is available to senior students in Mechanical Engineering as technical electives. With such training, they are able to qualify

(Continued on next page)

TEXAS A. & M.

(Continued from page 46)

all problems in structures and materials, and new equipment is constantly being added to increase the value of the department to the aircraft manufacturing industry.

Static testing of airplanes and airplane parts is carried on by students and faculty for the primary purpose of preparing graduates adequately for the positions they will be called upon to fill either with the armed services or with the engineering departments of airplane plants.

The Army and Navy Air Forces as well as airlines and airplane manufacturers have co-operated in furnishing parts and equipment with the result that the airplane laboratory is rated as one of the finest in the country.

400 Workers Training

Through co-operation of the U. S. Office of Education the department is collaborating with the airplane plants in Texas and A. & M. staff members are teaching aeronautical engineering subjects to the employees of these plants. Nearly 400 students in the Dallas area alone are being trained through this department.

As a necessary part of its facilities needed to train aeronautical engineers, the college is provided with its own 400-acre airport which is now being completed at a cost of $305,000. This airport was made possible through the action of the board of directors of the college with the co-operation of the Civil Aeronautics Administration and the Works Progress Administration and is large enough to handle even the biggest bombers produced today. Located two miles from the center of the campus, the airport is in daily use by trainees in the Civilian Pilot Training program.

Cross - Country and Instructor courses are being given and large units of the elementary and secondary flight training programs are now being taught for the seventh consecutive term. College credit is given for the ground school course which accompanies this flight work and most of the graduates of this training are now on active duty with the Army and Navy Air Forces.

The college is active in development of landing strips and small auxiliary landing areas throughout the state of Texas.

Big Air Research Plan

The development of an aeronautical research center at the college is progressing rapidly. All of the facilities of the college, which has the second largest enrollment of any engineering school in the country, are now available for the solution of special problems related to aeronautics and allied subjects. Research and investigation are now being conducted on several confidential projects for aircraft manufacturers.

The Association of Former Students with more than 11,000 active members recently adopted the aeronautical research center as one of its prime projects. It is the plan of the college officials and former students to provide aeronautical research facilities second to none in the United States in line with a long standing principle of furnishing trained technicians for all of the state's industrial firms whenever those industries need the men.

For more than 66 years the State of Texas has been drawing leaders in the fields of business, engineering, agriculture, veterinary medicine and in military service from the A. & M. College. Now, Texas' need for aeronautical engineers will be filled by its A. & M. College.

Texas A. & M. College is on a full war time basis and all of the efforts of the college are directed toward a successful prosecution of our war effort. The college authorities, however, realize the important part that aviation is going to play in our post war commercial development and are co-operating to the fullest extent in establishing complete facilities for teaching, investigation, consultation, and research in the field of aeronautics.

UNIVERSITY OF TEXAS

(Continued from page 47)

as Junior Aeronautical Engineers under Civil Service for work in various research and aircraft development agencies of the federal government. They are also eligible for many phases of engineering work in the aircraft industry. At present, a considerable number of University graduates are contributing directly to the war program through active industrial work in aeronautical engineering. In 1941, Bachelor's degrees in Mechanical Engineering were granted to about forty men, seventeen of whom were employed in the aircraft industry. In 1942, it is anticipated that there will be about fifty graduates, with from fifteen to twenty entering into some phase of aircraft activity. Interest in aeronautical engineering is high among University of Texas students, and as the program of instruction is developed and expanded, more men with better and more complete training should become available to the industry.

Complete Program Planned

As a further step toward meeting the present tremendous demands for technically trained men, the College of Engineering is making a more complete program of courses available during the summer of 1942. By taking a full program of summer work, a student who would normally graduate in June, 1943, may complete his work in February. A similar speed-up will also apply to students in the lower classes and will undoubtedly be continued for the duration of the war. The University is also encouraging high school graduates interested in engineering to begin their training with the summer session of 1942, rather than wait until September as they would normally do.

Early in 1941, the United States Office of Education initiated its program of special short-term engineering defense training courses in order to relieve the acute shortage of technical men in the war industries. The University of Texas immediately began to participate in this program by offering a full-time course in aeronautical engineering in Austin. Men with two and one-half to three years of previous college work in engineering or applied science were admitted to the course and were given intensive training in the fundamentals of aeronautics for a period of fifteen weeks. The fourth group of these students is now undergoing training and by June 1, 1942, approximately seventy men will have completed the work. All but one of these men are now engaged in some kind of technical work in aeronautics.

Pioneers Defense Course

It is of interest to note that according to the latest report, February 28, 1942, of the U. S. Office of Education, the University of Texas offers the only full-time, comprehensive defense course in aeronautical engineering of the character just described.

It is planned to offer a new course beginning about June 1, 1942, and to continue with this training as long as there is a demand for these men in industry and Federal sponsorship of the program is continued. Available facilities could be expanded to handle thirty and forty men in each group.

In addition to full-time aeronautical work in Austin under the Engineering Defense Training Program, the University also pioneered in the development of part-time courses in aircraft work in Fort Worth and Dallas. This training is being provided for employees and prospective workers in

(Continued on page 70)

Our Course is Set...
NOW WE GO FULL THROTTLE AHEAD!
GLOBE AIRCRAFT CORPORATION
FORT WORTH, TEXAS » U.S.A.

U. S. AGENCIES TRAIN TEXANS FOR AIRCRAFT INDUSTRY

Linked to Plane Plants by the U. S. Employment Service, WPA Finds Labor and Trains It for Crafts

By AL HARTING

IN ALL parts of the state, workers from the rolls of the Work Projects Administration are being groomed as reinforcements for Texas' vital warplane production front. In towns on the western plains and in the cities where major plants and factories are centered, war-born National Defense Schools are operating on 24-hour-a-day schedules in an effort to meet the mounting labor needs of industry.

Directed by the State Board for Vocational Education, through the various local boards of education, defense schools requisition their trainees from the WPA and from the United States Employment Service of Texas. Currently, more than 2,000 WPA men and women are learning the job operations for which workers are needed by war plants. A major percentage of that number will go to the aircraft industry. In the thirty-five defense schools in which WPA is participating in Texas, veteran instructors are teaching their students machine tool operation, aircraft sheetmetal layout and riveting, aircraft welding, aircraft engine maintenance and overhaul, aircraft electrical manufacturing, and blueprint reading.

Through its Division of Training and Reemployment, created to facilitate the placement of workers in industry, the Texas WPA already has sent several thousand qualified persons into private jobs. Hundreds of those defense school graduates now are at work in Texas aircraft plants and others have gone to plane production centers in other parts of the nation.

In increasing numbers, WPA women are joining the march to jobs at warplane plants. Hands quickened in the operation of office machines or in the everyday tasks at home now are operating rivet guns and welding torches. At the big Dallas National Defense School, showplace of the Texas vocational training set-up, approximately 150 WPA women currently are receiving instruction in aircraft ignition work, in aircraft sheetmetal layout and riveting and in aircraft welding. Many former WPA women already have been hired at plane plants where they have proved themselves to be particularly valuable in performing jobs requiring repetitive hand motions or detailed assembly.

Eager to make good in their first chance to return to the society of privately-hired men and women, these ex-WPA workers definitely have proved their ability to shoulder responsibility. Management and labor have given them their stamp of approval. Many former WPA workers, since entering private employment have received promotion, others have been commended for their speed and efficiency.

In addition to referring labor directly to plant personnel officials for consideration, WPA also conducts an on-the-job training program. In-plant trainees are selected from among those workers enrolled in defense schools and are paid by WPA the learner's rate in force at the particular factories to which they may be assigned. The on-the-job trainee may study the job for a period not to exceed 160 hours and the concern's officials may study their prospective employee before hiring him.

Trainees are subject to all of the plant's rules and regulations and may be hired or fired at the discretion of the company officials. They are covered by federal compensation in case of personal injury.

NYA Shops Are Proving Ground for Thousands of Young Workers. Army and Navy Find Them Capable

By DOROTHY BALDRIDGE

NATIONAL Youth Administration workshops which dot the Texas countryside have trained over 2,000 young men and women workers for aircraft and other war industries and the armed services in the last six months and are capable and willing to increase their output for new demands.

Today in Texas 3,188 boys and girls are in training for war production

(Continued on page 52)

Typical of WPA-trained aircraft workers, Mrs. Lois Sigler, 20, solders end connections on ignition wires at Dallas National Defense School, government's "show place" in Texas.

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FULCHER (ARMY) ARMSTRONG ★ WICHITA FALLS, TEXAS

U. S. AGENCIES

(Continued from page 50)

work in 57 NYA training centers. J. C. Kellam, state NYA administrator with offices at 714 Brown Building, Austin, Texas, invites inquiries from the aircraft industries.

Location of Centers

Ten NYA full-time war work centers in Texas, which house the youth, are located at Ranger, Marshall, Houston, Inks Dam (near Burnet), San Marcos, Corpus Christi, Gladewater, Prairie View (negro), Kingsville and Waco.

Forty-seven local NYA shops, to which youth are assigned who travel back and forth each day from their homes, are located in Dallas (2), Bonham, Ranger, Waco (5), Meridian, Hillsboro, Lufkin, Smeltertown, Brenham, Laredo, San Antonio (5), South Houston, McAllen, Cleburne, Fort Worth (3), Tyler, Kenedy, Graham, Kaufman, Austin, Seguin, Waxahachie, Paris, Greenville, Cuero, East Bernard, Port Arthur, Palestine, Denison, Camp Normoyle, El Paso, Harlingen, McKinney, Fort Ringgold, Fort McIntosh and Fort Brown.

Training in these centers consists of sheet metal, aircraft riveting, welding, machine shop, foundry and pattern-making, airplane mechanics, automobile mechanics, radio and production sewing machine work.

Students are always available for private employment opportunities. Shop superintendents and instructors report to the United States Employment Service when boys and girls have advanced sufficiently in their knowledge and workmanship to be ready for work in industry, and that agency serves as the contact between the youth and war production industries.

Training Expanded

All Texas NYA war work projects are being expanded now to include facilities for young women as well as for young men. Since war was declared, NYA projects have been operating on a three-shift basis.

Today, Texas industries and Army and Navy establishments are clamoring for more and more trained workers. These plants and posts in the last six months have taken over 2,000 NYA boys and girls into their shops as welders, sheet metal workers, machinist's helpers, foundry workers, shipfitter's helpers, radio operators, airplane mechanics and production sewing machine operators.

From the NYA project in aviation mechanics and airport groundwork at Fort Worth, the U. S. Employment Service has placed twenty-one youths with the War Department at Hicks Field in Fort Worth, eleven with commercial airline companies, twenty-three with private flying schools, four with the Civil Aeronautics Authority, eight with the Fort Worth Municipal airport, two with the Wichita Falls Engineering School, nineteen with the Duncan Field Army Air Depot, two with the Corpus Christi Naval Air Station, and four with the Army Air Corps flying school at Randolph Field.

Outstanding among Texas NYA war work centers is the one at Waco, where Opal McCraw trains for an aircraft plant by operating a drill press in the sheet metal division. Women are outnumbering men in training courses.

More Women Training

At the NYA war work center at the Naval Air Station at Corpus Christi, established last December, 136 boys have received Civil Service appointments as helper trainees and 275 are now employed at the center in repair, construction, and maintaining airplanes and engines. Their assignments also include metal manufacture and repair, electrical, drafting, and instrument work, and they assist in inspection of electric and control systems, undercarriage brakes, motors and propellers. After hours they are being trained in radio theory, shop mathemathics and blueprint reading.

Sixty young women are training in the NYA center at Waco in radio, sheet metal, machine shop, aircraft riveting and production sewing machine work. The center is rapidly building its girl enrollment to 200. Girls are entering training in growing numbers in other NYA centers throughout the state to learn machine, sheet metal, radio, riveting, power sewing and woodworking.

The National Youth Administration, in giving work experience to Texas youth in airplane mechanics and airport groundwork, as well as in other basic manual and mechanical skills, is joining with city, state and other federal agencies fully to cooperate in our all-out war effort.

Wings over TEXAS

From the assembly lines of our giant Texas aircraft plants come rolling the swarms of speedy train planes for our young pilots and the clouds of heavy bombers headed for far-flung battle lines. And from hu Texas refineries come the fuels and lubricants that make those planes the masters of the air.

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First call on all Humble Aviation Products is reserved for the Air Force. But Humble Aviation Gasoline a Humble-Esso Aviation Oil are still available for the light planes and transports whose job today has become important. For all the wings over Texas — for trainers, transports, light planes and bombers — Humble striv today, more than ever, to keep 'em flying.

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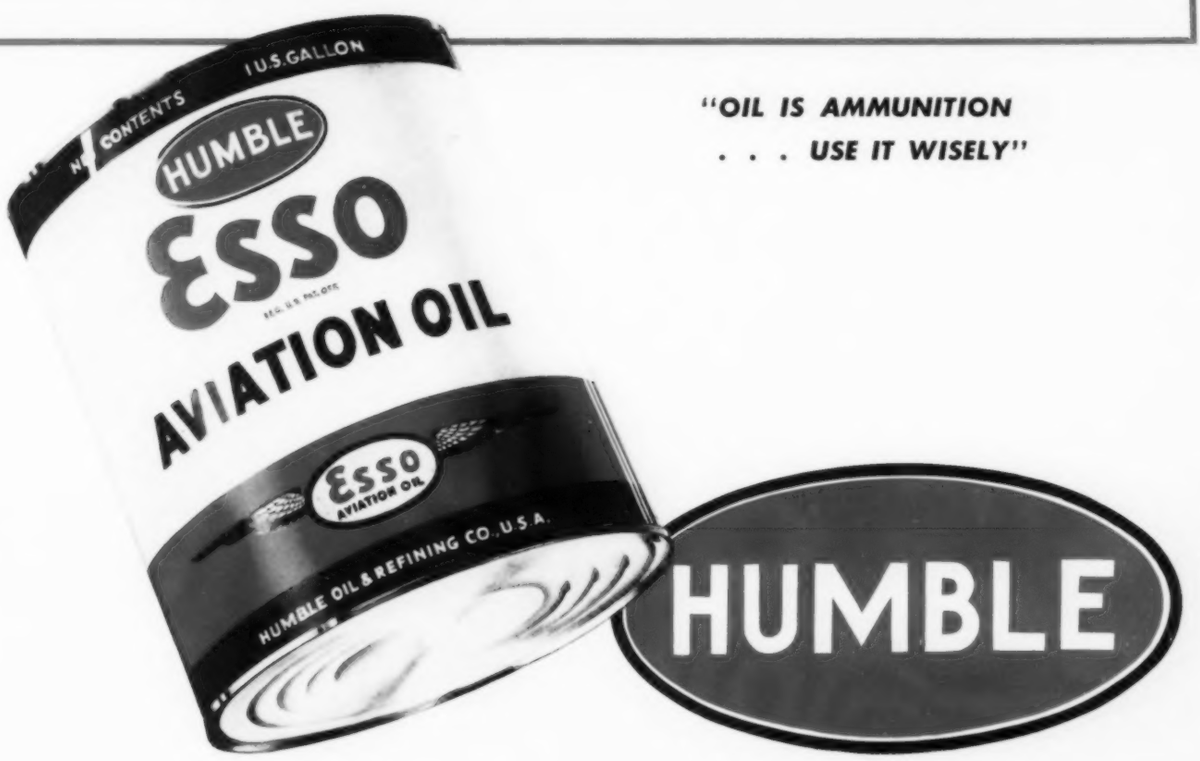

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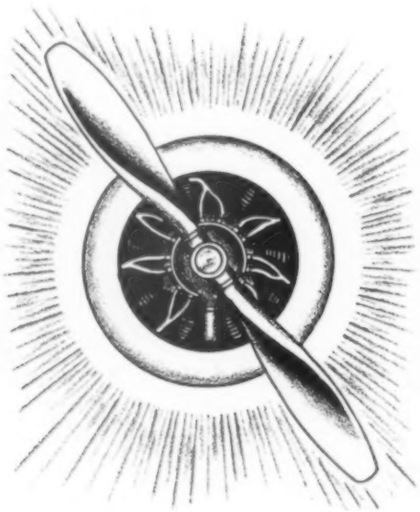

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Guiberson's ability to manufacture these precision parts to the highest standards established by the leading aircraft manufacturers is some evidence of Guiberson's understanding of aircraft manufacturing problems, and its ability to do a job for the aircraft manufacturer.

Guiberson is proud of its part in Southwestern aviation industry's all-out effort for national defense. We at Guiberson's have the most profound regard for the importance of any and every phase of the aviation industry. It concerns the destiny of us all.

Guiberson

AIRCRAFT and HEATER DIVISION

DALLAS, TEXAS

Facilities to Spare!

Less than one-half the known available subcontract facilities in the Lone Star State are now being utilized for aircraft. WPB and Southern Flight offer assistance in making connections

By TOM ASHLEY

TEXAS offers a comprehensive array of tools and shops to outside production men, other officials of aircraft industries and government agencies seeking additional subcontracting facilities for aircraft production.

Of approximately 1,500 industrial plants and shops of all kinds in the state, about one-fourth are suitable for aircraft subcontracting. Only half are now engaged in work for the aviation industry. And of these, numbering approximately 350, less than 175 are at capacity.

This picture, gained from government sources, emphasizes the fact that *facilities actually exist—right now—for more than doubling the current volume of Texas subcontracting in the aviation industry.* It can be done without delay.

Within recent weeks more and more production has been contracted for. But the aviation industry still has a long way to go before using up *existing* facilities in Texas.

In the Fidelity Building in Dallas are located regional offices of the War Production Board's contract distribution branch. A. J. Langford, area manager, is a practical business man, and factory representatives or potential subcontractors can get into his office without delay—Langford has made it possible to do business with his office in a plain, every-day manner which is 100 per cent Texas and not the least bit Washington-like.

The other day a shop owner went to Langford's office and told him he had been offered a contract for a quantity of packing nuts for a large Texas airplane plant. But he lacked some of the equipment. In a few minutes Langford had shown him where he also lacked adequate finance and instructed him to survey his plant, his finances and his contract possibilities. Three days later he returned. Engineers of Langford's office analyzed the packing nut blueprints and from their files located a carburetor manufacturer to furnish the facilities needed. Langford took the subcontractor across town to the Reconstruction Finance Office, which promptly—then and there—agreed to a $100,000 federal loan.

A. J. LANGFORD
Area Manager, War Production Board's Contract Distribution Branch

In his Dallas office are detailed facts describing Texas machine tools, shops and labor available for aircraft subcontracting. Outside production men and others seeking such data, which can not be published because of war restrictions, are urged by Langford to visit him. His engineers will analyze blueprints and component samples, suggest how to utilize available facilities most effectively, and even make detailed surveys to fit special requirements. Langford also will personally assist subcontractors in arranging for federal financing.

Six hours later bar stock was on its way to the little plant and another subcontract was an accomplished fact.

"We're here to help get more production," says Langford. "We do not award contracts. We help the contractor find needed facilities and we help those having the facilities find the work to do. We assist in arranging for finance."

Months ago the job of listing Texas facilities was undertaken. Today Langford's office has a file containing all the information available from many sources on Texas machine shops and industries of all kinds. War restrictions prevent publication of names and locations, but we were able to obtain sufficient generalities to show that information and technical data of great volume is readily available for the aircraft industry.

If you're seeking aviation subcontracting facilities in Texas, you can find in Langford's office detailed information on the following estimated man hours available on a few types o. specific tools:

	Per Month
Automatic screw machines	5,000
Turret lathes	20,000
Engine lathes	310,000
Boring mills	34,000
Milling machines	34,000

The figures are in round numbers to emphasize that they are approximations. The purpose of citing them is to prove that sufficient facilities are instantly available in Texas to warrant full inquiries by aircraft contractors out of the state. In other words, gentlemen, Texas is still wide open and hasn't been committed to capacity by any means. If you want to do business, you can find instant and thorough co-operation at the WPB contract distribution office in Dallas.

A large portion of this pool of machinery is held by firms and shops in the oil field equipment business. Many of these firms are readily convertible to handling airplane oleo struts, which are being demanded in ever-increasing numbers. Hundreds of other items for airplanes can be obtained through subcontracting and sub-subcontracting in Texas.

SOUTHERN FLIGHT's staff will gladly devote all energy possible to production men and potential subcontractors seeking detailed information on the facilities which are waiting for their work. In this issue are numerous advertisers who are equipped to do a job for the industry — they want your inquiries. And the welcome sign is always out at the office of the WPB's contract distribution branch.

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SUBCONTRACTOR CITES HIS EXPERIENCE IN WAR ORDERS

Some Hints to Guide Others Entering Business With Uncle Sam. You'll Be a Better Business Man When It's Over

By W. G. GREEN
President, Engineering Laboratories, Inc.

MOST Southwestern and Southern small plants have for years been doing a species of contracting and subcontracting business. On practically every contract they have received, they have been forced, because of lack of equipment, materials or special facilities, to sublet a part of it. Even the purchase of certain raw materials, castings, patterns, plating, anodizing or sand blasting comes in this category.

Now that we are fighting a war, it becomes necessary for every plant to participate some way or other in the war effort. Practically no small plant is complete enough within itself to handle any kind of a subassembly or assembly job in its entirity. It must, therefore, if it takes any kind of a sizeable subcontract or prime contract, figure on having some portion of the job done outside its own plant.

Plenty of Business

Two outstanding facts stare each of us in the face:

1) To win the war we must participate in the war manufacturing.
2) Materials for civilian use are becoming so scarce and hard to get that most entirely civilian plants will be shut down.

Practically, then, there is no alternative — you must get into the war production.

There is plenty of business to be obtained. Your local War Production Board will tell you where and how to bid on government prime contracts, and which local industries already have contracts, and the kinds of work available. They will also help you with your financial problems, if and when they come up.

Do not be afraid of these WPB men. They are out to get a job done —just as you are—and your aims are identical.

When you decide to take on some war work you will need to look out for many contingencies.

Government contracts and subcontracts all carry very complete specifications, which are considerably tougher than most of us, even in precision shops, have been accustomed to following. To turn, grind and plate a cylinder 2 inches in diameter by 14 inches long to .00025 over its entire length is quite an undertaking. It is quite unusual in industrial practices. In this connection, then, it will be necessary for you to make allowances for extra care and precision of manufacture.

All items you make must be entirely interchangeable; therefore, very precise jigs, fixtures and tools must be made. In your quotation or bids on these contracts be sure to allow plenty for the contingencies, care, etc., which may be required.

Close Inspection Necessary

Every small or large part going into an Army contract may be rejected by Army inspectors. These inspectors are fair, but they hold exactly to the blue prints and specifications. It therefore will be necessary, if you are doing any volume of work at all, to install an inspection department in your plant. Micrometers, thread gauges, go and no go gauges and other inspection tools will be required. Each small part must be thoroughly and completely inspected. If you rigidly and thoroughly inspect your own materials before they leave your plant, you may be able to save many of the rejections by reworking them.

For example: anything over tolerance can be cut down while anything slightly under tolerance can be brought up by a slight plating. Tubing may be straightened, welded joints can be lined up and many other savings result from operating your own inspection department. If you are doing a considerable amount of contracting or subcontracting, the chances are that the Army and your immediate client will each put its own inspectors into your plant.

You will probably find, if you run an efficient shop, that when you subcontract certain parts out to other smaller shops in your vicinity, they either will not exercise the same care or the same efficiency that you would use, so that you may be in for a little trouble. This can not be entirely cured, but you will help some by sifting through all the shops you can find and by determining which shops are the best fitted for the job. You will discover that some of the shops in your town can not be used at all. True, they may have lathes, drill presses, grinders, etc., but the machines will be 20 to 30 years old, or will have been mistreated, or are too light, or there is not sufficient expert personnel to man them. This will be the great American tragedy; that is, that there are many machines, facilities, and above all, men, who can not measure up to the specifications.

Watch Other Fellow

If you intend to sublet part of the war work you get, you must find out as near as possible ahead of time what the sublet parts will cost you. You will find that in many cases you can not apply your own cost system to subcontracted parts, because other people will not work as fast or as cheaply as you do.

An example: In our plant, we have several turret machines and have found by long experience that our actual cost per hour on a turret lathe, including overhead, rent and every conceivable charge, is $2.25. We have normally tried to figure about $0.50 an hour profit, which would bring the total cost, as we would bid on a contract, up to $2.75 per hour. Yet the cheapest turret lathe time that we can buy in our vicinity costs us $4.00 an hour. Whenever we have work done outside in another plant, we have to do a certain amount of supervision, for which we are almost forced to charge about $0.30 per hour. That would bring the cost, then, to us of turret lathe time in another shop up to $4.30. Still we have made no profit. In view of the fact that we may be responsible for the materials used and lost in the other shops, me must, of necessity, tack on some charge which will cover such items and possibly provide us with a little bit of profit for our effort. Assuming that we were content to let $0.50 per hour take care of both our profit and our contingencies in this case, the turret lathe time in some other shop would have to be bid to our clients at a minimum of $4.80 per hour. When this is compared with $2.75 per hour which turret lathe time would cost our client, if done in our own plant, it is obvious that this is not a very efficient way, as far as price is concerned.

At this point, another factor steps in and that is that in our own experience, we have found that turret lathes in some other plants did not do as much work per hour as they do in our own plant. We have concluded in

many instances that turret lathe work done in another plant may cost us twice as much as it does in our own plant. For that reason, we have seen fit to purchase additional machinery, since, to our Scotch souls, it is abhorent to pay twice as much for something as it seems to be worth, no matter whose money it is.

Adequate Financing Vital

If it is at all possible, you should make your client furnish all materials. This is not possible, in many cases, with the government, if you hold a prime contract, but is possible many times where you are subcontracting from a large company. In this connection, it is wise to try to get all of your material together before you do too much work on it; otherwise, you may find that you have a tremendous amount of money tied up in work-in-process, which can not be completed because of lack of some essential material.

The most serious problem you will probably have to contend with will be the financing of your project. If you take on a government contract or subcontract, where you have to furnish the materials, you will have to invest a considerable amount of money in such materials before you are even able to start the job. Then, when you have actually started work, you will be paying your men, your overhead expenses, etc., sometimes for several months before you will have completed anything you can deliver and collect on. Sometimes they are a little slow on paying and you may have to wait another sixty to ninety days before you get your money.

The safest thing to do is sit down with a sharp pencil, figure out how much money you are going to need, lay out a schedule of such needs and go see your banker. Most banks have demonstrated their willingness to loan money against contracts, wherever they felt that the contractor had the ability to deliver. The government has now made it possible for any contractor or subcontractor to borrow up to 100 per cent of his contract figure from the RFC or local banks with RFC guarantee. This is now accomplished in a very short time with a minimum of red tape. It is not necessary to hock your business — you simply draw money against your contracts.

Don't Fear Priorities

You may have a little trouble at first getting on to the routine of priorities; however, that will quickly adjust itself. Every government order carries a preference rating or priority and if you contract or subcontract government work, such a rating will be extended to you. You in turn can furnish extensions of your rating to whomever supplies you with materials, outside work, etc. Most government ratings are high and will get you materials and equipment in a minmum length of time. There is no use to be afraid of priorities. It is a form of red tape, but is necessary in order to get the job done the most effectively.

You may find that it is either inconvenient or impossible to obtain certain help from subcontractors in your vicinity. It may be, then, that you will need to purchase some new machinery and install new departments in your plant.

In our case, we found that we could not control our plating and grinding on the outside as well as we desired, so we installed both a grinding and plating department. These departments are functioning perfectly and that expansion has made our plant much more desirable from a peace time standpoint.

In general, it might be the best logic to expand your plant only along such lines as you would find desirable for peace time work. The government has set up a means for furnishing additional new machinery wherever it may be required in a plant in order to complete the facilities for doing a certain job, assuming that outside facilities are not immediately available. Your prime contractor knows the ropes on this business and can help you obtain such equipment from the government at no expense to yourself. Of course, the machinery will remain the property of the Defense Plant Corporation and may be removed from your plant at any time they see fit.

One Plant's Experiences

Perhaps it would serve to illustrate a little more clearly what we have been talking about by drawing you a picture of the changes that have taken place in our plant since we went in war business.

Prior to October, 1940, our plant was engaged in making several kinds of oil field specialty equipment and tools. These included seismograph instruments, portable rotary drilling machines and related tank trucks and equipment, bottom hole pressure gauges, samplers and related laboratory equipment, some electrical and radio parts which went into the seismic equipment. We had a fair machine shop, with precision equipment; we had a welding shop and electrical shop and an assembly department. In addition, we had certain engineers and laboratory technicians who did research work. Our plant worked 40 hours per week, with overtime only in cases of emergency. Our overhead rate was about $1.78 per hour. Our total monthly expenditures, including materials, ran from $25,000 to $30,000. We were doing an annual business of about $350,000. We had no inspection department; that is — a formal one with full time employees. Our inspecting was done by the foremen of the different shops.

We had no guards around our plant or at our front door and no register for visitors. People came and went as they saw fit and it was not unusual to see as many strangers back in the shop as there were employees. (Incidentally, we had to correct our inventory downward at the end of each year by a number of thousands of dollars and we never knew whether that material was carried out the front door by visitors or whether our bookkeeping system was so poor that it didn't get charged to the proper customers. Anyway, that served to considerably reduce our profit on the final check-up.)

In October, 1940, we got our first government contract. We bid on it along similar lines to bids we made on commercial work. We lost our shirt on that bid. We lost it because we never figured on the close tolerances and we did not know how much work we would have to do in the way of inspecting and revising, etc. However, because it was a small contract to begin with and because we did fight it through and make proper deliveries in the end, we established a good enough reputation to enable us to get more and better contracts. On all subsequent contracts we have been raising our sights and our bids.

Extras Cost, Too

We found, for example, that certain costs required of us by the government and / or the contractors actually added 10 per cent to the cost of doing business. These costs were:

1) By government order, we were required to post guards on duty in our plant 24 hours per day. We were required to set up a visitors' register at the front door and to require all persons coming into or leaving the plant to go through one or two guarded entrances and exits.
2) We were required to set up a completely new inspection department with four or five permanent paid employees and utilizing a considerable amount of floor space, lights and other equipment.

(Continued on page 70)

GLOBE GETS ATC ON SWIFT

Newest Contender in Lightplane Field Completes Tests; Texans Designed and Built It

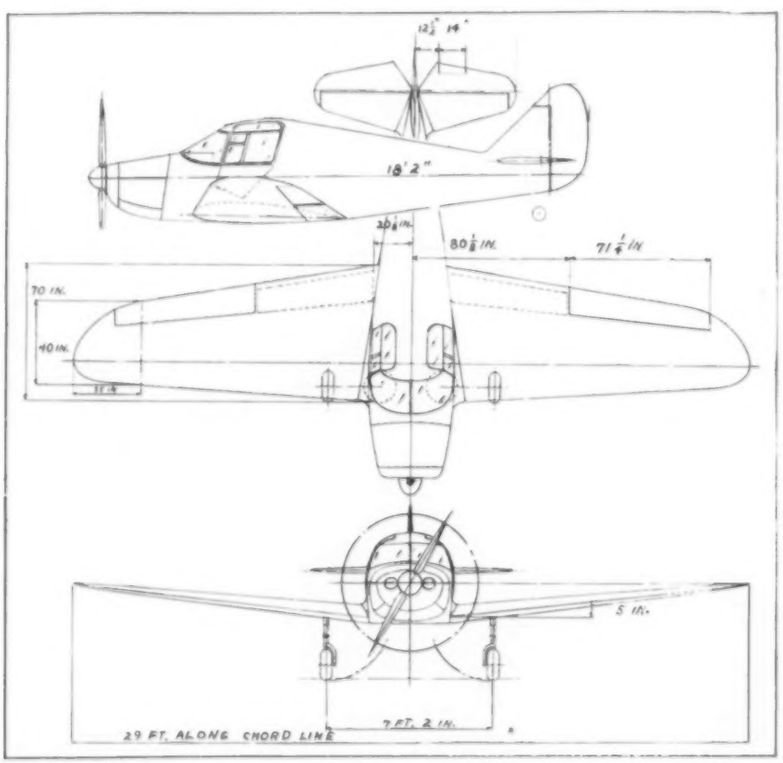
THE first step towards quantity production of small planes in Texas has been taken by Globe Aircraft Corporation at Fort Worth following receipt of CAA approval of its sporty little Swift, a two-place, side by side, low-wing monoplane with retractable landing gear and controllable pitch propeller.

John Kennedy, president of Globe, predicts the Swift will be an important factor in expanding private flying and commercial training throughout the South. It will contribute greatly to the growth of the aircraft industry in Texas after the war. Kennedy is as proud of the little Swift as he is of Globe's big Army contract for twin-engined trainers.

The Swift, designed to sell in the $3,000 class, has a 29-ft. wingspread, flaps and a maximum speed of 138 miles per hour and a cruising speed of 128 miles per hour. It is powered by an 80-H.P. Continental engine and has a Roby controllable pitch propeller. Fuel consumption is less than 5 gallons per hour, or about 26 miles per gallon in auto terminology. A 20-gallon tank furnishes a cruising range of about 530 miles.

Many unusual features include its tapered wing with plywood skin over which fabric is doped. The wheels are placed well forward and have a tread of 7 feet 2 inches. With K. H. Knox as chief engineer and T. R. Yarbrough as test pilot, thirteen months of exhaustive experiment went into the Swift before it received the ATC. Although its design represents a significant advance in the small plane field, the Swift is basically conventional in all respects. It was intended for commercial training and private operation.

The wing is of the monobeam type with an auxiliary rear beam providing attachment of the aileron and wing flap. Construction consists of a main beam of rectangular cross-section between the center line of the ship and a location just outboard of the landing gear attachment, where it transforms into a built-up I beam section consisting of mahogany plywood web with spruce flanges. Ribs are of all-wood construction of mahogany plywood skin which, together with spanwise spruce stiffeners and compression ribs, provides a semi-monocoque structure resistant to torque and chord loads. Adequate drain and ventilation holes reduce water traps and condensation to a minimum.



The wing is completely covered with fabric, doped to the plywood skin. Internal wood structure is treated with a heavy coat of varnish.

Of the four longeron type, the fuselage is constructed of welded steel (S.A.E. X-4130) tube trusses. The complete structure is treated internally with oil and externally with two coats of zinc chromate primer.

Tail surfaces (stabilizer, elevator, elevator tab, vertical fin and rudder), with the exception of the stabilizer, are constructed of steel sheet ribs of the web type and covered with doped fabric, which is also true of the aileron and wing flap construction. The stabilizer is a two-spar wooden structure with spruce ribs and a plywood cover, and doped fabric is used as an external cover over the plywood. Ventilation and internal protection from the elements are provided as in the wing.

Control surfaces are hinged entirely by ball bearings and either ball or needle bearings are used in every main joint in the control system. Elevators are controlled by a push-pull tube arrangement which give an upward travel of 20 degrees and a downward travel of 30 degrees. Ailerons are controlled by a push-pull tube system in which a differential action is achieved providing upward travel of 20 degrees and downward travel of 15 degrees. The cable-controlled rudder has an angular travel of 30 degrees each side of neutral. A hand lever and cable pull mechanism operate the split type wing flaps with settings of 0, 15 and 30 degrees.

Hinged to the main wing beam, the single strut cantilever type landing gear retracts inboard into the belly. It is anchored in extended position by spring-loaded locking pins which slide into sockets as the wheels reach down. A manually controlled pump, requiring eleven complete stroke oscillations, operates the hydraulic system. A selector

(Continued on page 70)

TEXAS HAS THE *Labor!*

By JOHN D. REED
Commissioner, Bureau of Labor Statistics

While shortages hamper war work in other states, labor is plentiful in Texas. Half a million are unemployed. Public employment rolls list 265,000 as wanting work.

TEXAS, because of its location, climate, and vast area, has been selected by the Government as a location for a great many defense industries, including aircraft plants. Just what this huge industrial program means to Texas is yet to be seen. However, we do know that up to the time that the publicity given to war contracts was stopped, over a billion dollars had been spent or was contracted to be spent in Texas by the federal government and private industry. A great many projects have been added since that time. I think we can assume the future industrialization of Texas is an assured fact. Let us see what we have to make this prospective program a success.

First, what is the manpower picture? The last census showed Texas as having 4,738,000 over fourteen years of age. Of these, 2,265,000 are working. We have another 500,000 available for work and of these approximately 265,000 are listed at this time with the United States Employment Service as wanting employment. This does not include the estimated 300,000 farm workers of this state who follow the crops.

These figures indicate we have an abundance of labor at the present time for industry, although much of this labor is unskilled and before it can be absorbed, some training will be necessary. But this is being accomplished faster than most people realize.

For instance, one year ago we had 30,000 people working in plants turning out war materials and today we have 80,500. With all of the expanded facilities for training, we believe that there will be a minimum of 143,000 persons engaged in this type of production by the end of another six months. This may seem to be a large increase, yet as non-essential industries are shut down, those skilled workers can be absorbed with very little, if any, training.

The Texas factory worker has fared better than ordinarily with his living conditions, for as the plants have gone up, housing facilities have been expanded to fit the needs, and the permanent employees, at least permanent until the war is over, do have a chance to live like human beings and under fairly normal conditions. Near the site of a large aircraft plant in Dallas County homes have been erected by the government, and as employees were trained and put to work, they have been absorbed into the normal life of the community.

In all of this expansion of industry and the transplanting of workers, the relationship between employers and employees of Texas has been especially cordial. What few differences have come up have been settled quickly without interrupting the production program.

Texas, having been an agricultural state for many years, is not extensively organized despite the fact that there are over 2,000 local labor unions in Texas today. We have some very old labor organizations in the state and of these, many have enjoyed steady growth since their formation. The greatest numerical strength lies in the American Federation of Labor groups who are represented by the Texas State Federation of Labor.

In conclusion let me point out one other thing that has been and is a factor in the expansion of private industry of this state. That factor is the taxation policy of Texas. We have no state personal income tax; we have no retail sales tax. As these are direct taxes on the people, we are fortunate that these taxation methods have not been used here.

A Strike Law That Works

In 1941 the Texas Legislature enacted an anti-strike law, considered at the time to be a big factor when new industries would move into the state. Strike violence is punishable by a maximum prison sentence of two years.

The Texas anti-strike law reads as follows:

Section 1. It shall be unlawful for any person by the use of force or violence, or threat of the use of force or violence, to prevent or attempt to prevent any person from engaging in any lawful vocation within this state. Any person guilty to violating this section shall be deemed guilty of a felony, and upon conviction thereof shall be punished by confinement in the state penitentiary for not less than one year, nor more than two years.

Section 2. It shall be unlawful for any person acting in concert with one or more other persons, to assemble at or near any place where a labor dispute exists, and by force or violence prevent or attempt to prevent any person from engaging in any lawful vocation, or for any person acting either by himself, or as a member of any group or organization, or acting in concert with one or more persons to promote, encourage or aid any such unlawful assemblage. Any person guilty of violating this section shall be deemed guilty of a felony, and upon conviction thereof shall be punished by confinement in the State penitentiary for not less than one year, nor more than two years.

Section 3. The term labor dispute as used in this act shall include any controversy between an employer and two or more of his employees concerning the terms or conditions of employment or concerning the association or representation of persons in negotiating, fixing, maintaining, changing or seeking to arrange terms or conditions of employment.

Section 4. The provisions of this act shall be cumulative of all other existing articles of the Penal Code upon the same subject, and in the event of a conflict between existing articles and provisions of this act, then and in that event the provisions, offenses and punishments set forth herein shall prevail over such existing articles.

Section 5. If any section, paragraph, clause or provision of this act is declared unconstitutional, inoperative or invalid by any court of competent jurisdiction, the same shall not affect or invalidate the remainder of this act.

Section 6. Emergency clause.

Making America's Sky Warriors

By MAJOR GENERAL BARTON K. YOUNT

Commanding General, Flying Training Command

THE course of events in Europe and more recently in the Pacific area has demonstrated conclusively that air power is apt to be the deciding factor in modern warfare. This year and next will bring on the great crisis. America must gain air supremacy now. The urgency of the need is a tremendous challenge to our rapidly expanding aircraft industry to strain every effort to produce the 60,000 military aircraft required by our Army and Navy during 1942. It is no less a challenge to our Air Forces to provide a huge pool of highly trained airmen to man these planes, as well as a vast army of technically trained maintenance and service crews.

To meet this challenge the Army Air Forces have recently set up a Flying Training Command to centralize the tremendous task of providing the flying personnel required for the expanded air program — a program superimposed on plans already expanded several times at a breath-taking pace. To take our new warplanes into the air, a constant stream of bombardiers, navigators, pilots, and aerial gunners must also flow from our training centers.

Bottlenecks Are Eliminated

The Flying Training Command was created to bring all of the training centers under one unified control, eliminate bottlenecks, speed up the program, and add new facilities so that an ever enlarging supply of competent personnel may be sent to our combat commands. This must be done with all possible speed in order to make up American Air Forces wherever needed in the rapidly expanding world conflict.

At the present time the Flying Training Command is housed on the fifth floor of the Maritime Building, Washington, and the place is humming with activity. New sets of figures are being worked out to step into line with the total flying personnel required to meet the present goal of an Air Force of a million men and with the possibility that this number may eventually reach two million. Figures are being co-ordinated with aircraft procurement schedules to insure the proper proportions of combat pilots for fighter planes, two-engine and four-engine bombers, bombardiers, navigators and gunners — all to synchronize with the delivery of the planes. Plans are being set up for operational training in which pilots will receive additional training and members of combat crews will learn to work together as a highly efficient team.

Training courses are being revised to include the latest tactical lessons learned the hard way in the actual crucible of war in the air, including an increased emphasis on dive bombing, the use of aerial torpedoes and the employment of gliders. In co-operation with other divisions of the Air Forces, new sites, schools and necessary facilities are being arranged which eventually will more than double the present program.

Emphasis on Quality

Despite the unprecedented increase in our pilot training program — from about 500 per year in 1938 to 30,000 per year in 1942, plus substantial numbers from England for the RAF and smaller groups from Latin American countries and from China—we have kept our emphasis on quality. The acid test is combat against enemy air forces, and even in the short period since the active entrance of the United States into the conflict, American airmen have come through with flying colors, often against overwhelming odds. In many cases they have shot down hostile planes and reached objectives with their bombs on the very first trip aloft in enemy skies.

To enlarge the pool of available pilots the War Department has asked the Civil Aeronautics Administration to concentrate all CAA Pilot training in an all-out total war program. First priority in the training facilities of the CAA is to be given to the pilot training of students who can meet the revised requirements for appointment as Aviation Cadets in the Army Air Forces, and who are members of the Air Section of the enlisted Reserve Corps. After that the flight training is to be limited to students who, while unable to meet the requirements for appointment as Aviation Cadets, are otherwise qualified to pursue a course of flight training looking to the issuance of flying instructors' licenses under regulations of the CAA, and who undertake in writing to contribute future effort in a field of aeronautics adapted to serve the national interest, directly or indirectly.

This means that a total of more than 500 CAA Pilot Training units in all parts of the country are now being definitely harnessed to our war effort.

It is expected the CAA elementary flying training will be given to some 45,000 students this year, and that a large proportion of these will be carried on through the secondary stage, with considerable numbers taking cross-country, instrument and instructor

ARMY AIR FORCES FLYING TRAINING COMMAND TO MOVE HEADQUARTERS TO FORT WORTH, TEXAS

Headquarters of the Army Air Forces Flying Training Command is being moved from Washington, D. C., to Fort Worth, Texas, according to an announcement by the War Department. Major General Barton K. Yount is Commanding General of the Flying Training Command, and his Chief of Staff is Brigadier General Walter F. Kraus.

Although June 30 is the official moving date, advance representatives will leave Washington as early as June 1. The shift will involve approximately 100 officers and civilian employees, and their families. At present located in the Maritime Building, Washington, D. C., the Training Command headquarters will occupy four floors of the Texas & Pacific Building at Fort Worth.

flight training. To aid the constantly enlarging activities of the Air Force Ferrying Command, a special course will be given to approximately 1,000 pilots for this important field.

Even more striking than the zooming figures and activity in the pilot training is the strong emphasis we are placing on the other key members of the modern aircrew — the bombardier and the navigator. As recently as 1940 our facilities for this type of training were extremely limited, but now we are prepared to turn out these specialized flying officers in great numbers.

Need More Crews

In the same way, we are giving considerably more attention to the training of pilots for four-engine bombers. Within the past year or two the Air Forces' championing of the long-range multi-engine heavy bomber has been amply vindicated as a strategic weapon of the utmost value. The newest versions of our Boeing B-17 and Consolidated B-24, backbone of America's "heavy bomber program," already doubled twice and recently doubled again, will require an increasing flow of pilots and combat crews working together as a team, and the Flying Training Command is giving this a high priority rating in its present schedule.

American air power is already beginning to influence the fighting on several fronts in the world-wide battle for freedom, and there have been many thrilling examples of how effective our flying training has been and how good our planes are in comparison with the best the enemy has to offer. Straining every effort, and all pulling together, we can look forward to the time, not so far off, when the air-fighting strength of our nation will be such in both quality and quantity, that the starred red, white and blue wing insignia of America's air might will be a sign of supremacy—a symbol of terror to our enemies and of victory to ourselves and our allies.

Texas Supplies Half Class of Flying Cadets

Two hundred and eighteen Texans, a representation larger than many entire peacetime aviation cadet classes, were in the new 42-H basic training class enrolled at Randolph Field, May 1. Texans made up more than half the class.

Forty states were represented in the class that entered its second phase of air training.

The Texas contingent of potential flying officers is believed to be one of the largest from one state in one class ever enrolled in United States Army Air Force training.

To give the layman an approximate idea of the growing strength of the air force, Randolph Field is just one of a number of basic flying schools in the Gulf Coast Air Force Training Center, and there are two other similar training centers with a like number of cadets and more under construction.

The good-neighbor policy got a boost in the new class when twenty-four young South Americans from Argentina, Bolivia, Brazil, Chile, Ecuador, Peru, and Uruguay entered with their Yankee comrades. The Dominican Republic also sent a flyer.

Texas Schools Train 300,775 for War Work

A total of 300,775 persons are taking war preparation courses sponsored by the public schools of Texas and 163,000 students are being trained in agricultural, industrial, home-making and other classes which fit into the war effort, it was reported to Gov. Coke Stevenson last month by L. A. Woods, Superintendent of Public Instruction.

TEXAS

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DALLAS, TEXAS

HOW YOUR PLANT CAN JOIN WAR PRODUCTION

HOW do small and medium-sized manufacturers go about getting war work?

SOUTHERN FLIGHT asked the War Production Board's Division of Industry Operations. Here's how to go about getting war work:

The biggest mistake any manufacturer can make is to assume he hasn't a chance of getting war contracts. There are things he can do to get them. The War Production Board has set up administrative machinery to help him. By making full use of this machinery and supplementing it with determination and ingenuity, many manufacturers will bridge the gap—often a wide one—between non-essential and essential production.

Plant Survey Necessary

A complete survey of his facilities is the first step of every manufacturer who wants war work. This survey should begin with the firm's business record and should include a description of normal products made in the plant, the experience of managerial and supervisory personnel, previous war production experience, a financial statement and names of past and present customers for reference.

The manufacturer should take stock of his labor situation. In the survey he should list the number of his factory employees, their skills, peak employment of the plant for one, two and three shifts, a description of the available labor supply, and the competition for it, and a brief analysis of existing and nearby wage rates.

Then he should take stock of the plant and its equipment, describing location, transportation facilities, available power and water facilities and similar production factors.

Complete layout plans — accompanied by photographs — should be made for each section of the plant. Finally, a list of all tools should be drawn in which the type, make, age, size and serial number, as well as the tolerances usually followed, are included.

Since the survey is to serve as a guide both to himself and to those from whom the manufacturer must get his contracts, it must be accurate and complete. Since a complete survey is often expensive, the manufacturer ought to make full use of it.

Agencies to Contact

His survey will do him most good at the following places:

1. The nearest field office of the Contract Distribution Branch of the War Production Board. There are over 120 such offices conveniently located throughout the country and their addresses may be obtained by writing the Contract Distribution Branch of the War Production Board, Washington, D. C. At these offices a manufacturer can learn what war items are needed and get an idea of which he can make. He can study blueprints and samples. At some offices he will see exhibits of needed bits and pieces in which the prime contractors display actual parts and subassemblies they may want to farm out. Since the offices serve as a clearing house of information for government procurement offices and prime contractors, the manufacturer should keep in close touch with the office serving his district.

2. The Army's District Procurement Offices. By writing to the office of the under secretary of the War Department in Washington, the manufacturer may get a copy of "Army Purchase Information Bulletin" which contains the addresses of the various procurement offices, the type of products they buy and the procedure to be followed in getting orders.

3. The Navy's Bureau of Supplies and Accounts. A booklet, "Selling to the Navy", is just what its title indicates and may be obtained by writing the Bureau at the Navy Department, Washington.

4. Local prime contractors. As firms which now have contracts become more and more "loaded", they will become increasingly interested in the facilities of every plant that can help them fill their contracts. Addresses and other information can be obtained by bona fide manufacturers at Contract Distribution Offices, which have been ordered not to release such addresses and information for publication.

It must not be assumed there is any formula which will bring war work to all manufacturers, however eager they are to get it, with whatever zeal they pursue it. Harnessing the capacity of small, medium-sized and even large factories is one of the toughest production problems America faces, and there are many complicating factors.

One is that, because of the extreme urgency of stepping up production immediately, it has been necessary to place contracts with firms which were prepared to fill them—those which were already in war work, but whose capacity wasn't being utilized to the utmost. Another is the limitation in the kinds of work many of the firms without war contracts can do. One of the most important factors is the simple truth that until the attack on Pearl Harbor, America was not spending enough money on the war effort to employ maximum capacity of all its industries.

Recently Congress has appropriated additional billions of dollars—and is now appropriating billions more—for further war orders. Prime contracts are being placed with mass production industries as fast as committees representing them can be called together for conferences with the War Production Board's division of industry operations and the government procurement agencies.

Many Subcontractors Needed

Firms receiving prime contracts will need thousands of subcontractors to help them meet early delivery dates.

One fact that needs to be faced is that many large plants—those which were most easily converted and which have the bulk of the prime contracts —were slow in the past to subcontract work that could be handled by smaller firms. They will have to spread subcontracting now. And it is also true that many small manufacturers have been slow to realize that getting war work requires the same resourcefulness they showed in founding and building their businesses.

It takes time to convert a plant to war production, and a serious problem of many manufacturers is keeping their plants running, their workers employed, while in the process of conversion. Under certain conditions, the War Production Board has found it wise to allocate scarce materials for less-essential products in order to keep a plant going until its capacity can be fully engaged in essential production.

These scarce materials are usually granted only if the plant is converting toward war production as fast as possible and if a small amount of materials will keep a relatively large number of employees working.

Remember this—about 92 per cent of the 185,000 manufacturing plants

(Continued on page 70)

Keep 'Em FLYING

★ MACHINE EQUIPMENT—Turret and Engine lathes, milling machines, cutting equipment.

★ PUNCH PRESSES—Capacity, up to 80 tons; Power Brakes and Shears.

★ WELDING EQUIPMENT—Gas and Electric Aircraft Welders; Spot Welders.

★ PLATING PLANT—Electro Plating; Alumilit-ing—plain and colored; Anodizing.

★ MECHANICAL CLEANING EQUIPMENT—Sand blasting; steel pickling; alkaline and vapor degreasing.

★ ANTI-RUST OR OXIDATION—Automatic heating system permitting hot linseed oil application to interior surfaces.

These facilities now engaged in Governmental contracts are at present available for additional prime and subcontract Defense work.

★ NON-SKID SURFACING—Application of Carborundum Grit to any material.

★ PAINTING—Modern, high production, fireproof equipment.

★ TOOL ROOM EQUIPMENT—Modern tool rooms equipped and capable of producing dies, jigs and special machines.

★ BOXING AND CRATING EQUIPMENT—We maintain our own planing mill.

★ DEPARTMENT OF DESIGN AND RESEARCH—An experienced staff of new products development engineers.

★ MATERIAL LABORATORY—Graphical and actual testing of new methods of construction.

Universal

BUILDING PRODUCTS CORPORATION

2625 ELM STREET DALLAS, TEXAS

SUBCONTRACTOR'S EXPERIENCE

(Continued from page 61)

3) We were asked to handle a good many tons of the contractors' furnished materials and therefore we had to enlarge our stockroom, put in many additional bins, material racks, etc. Incidentally, we did not have enough room to handle the customers' tubing and bar stock in horizontal racks as we had been accustomed, and we built vertical racks throughout our plant and saved a considerable amount of floor space. This produces other economies too, in that the short pieces of stock are always at the bottom and are instantly discernible.

4) The War Department soon ordered us to work 24 hours per day 7 days per week and ignore all holidays. That means that now our plant works day and night, Sundays, 4th of July and all other days; we have to wear a badge to get in our own plant; there is a guard with a pistol at the door. Every visitor has to register, fill out a questionnaire, state his business and be checked in and out.

We are now doing about a million dollars worth of business a year, including our commercial business, which has not as yet suffered too much, since it is on fairly high priorities, and, because of the extra hours we have worked, we find that our overhead rate has dropped to about $1.25.

How War Helps Plants

Not all of the things have been bad by any means. We heartily recommend that you get your plant into government work, as you will find that it improves efficiency many fold if you go into it with the proper attitude.

In the first place, the Army's rigid specifications have taught us to do many kinds of machine work with greater accuracy and speed than we ever knew before. Second, we have greatly enlarged our sphere of activity, and our possible customers after the war have been at least doubled. Third, we are utilizing a great deal of otherwise unoccupied equipment for war purposes. We have brought a great deal of money into our own locality, and, in general, have improved our chances of winning the war.

Of course, there is a price you have to pay for everything, but we believe no price is too great to pay in defense of our country and our American way of living, and anyway, the recompense is well worthwhile.

The chances are that at the end of the war there will be very few plants in operation which have not engaged in government work. It is better to get in now than to wait too long. Anyway, it is your duty.

UNIVERSITY OF TEXAS

(Continued from page 48)

the aircraft plants now operating in that area. Courses were first established in the fall of 1941, and the program has grown continuously so that at the present time over twenty classes in seven different aeronautical subjects are in progress with between four and five hundred students enrolled. Similar training under University sponsorship for other aircraft manufacturing areas can be set up as needed.

Through the various phases of its aeronautical engineering training activities, the University of Texas is providing invaluable aid to aircraft manufacturers, both in the state and throughout the entire nation. Aeronautical engineers, who are so essential to our present aircraft production program, are thus being made available in a steady stream. Development of research facilities and expansion of its graduate program will enable the University to make even greater contributions to both our immediate military problems and to the development of air transportation and commercial aviation, for which a tremendous growth is anticipated following the inevitable victory of our armed forces.

GLOBE GETS ATC ON SWIFT

(Continued from page 62)

valve which directs the fluid flow controls the up and down direction of the gear. An emergency mechanical operation is also provided for extending the gear, and a warning horn is provided. Indicator lights flash red with wheels up unless locking pins are within 1/16 inch of locked down position, at which time the completed circuit will flash green.

Two large-size doors provide plenty of space to enter and leave the large cabin.

Standard fixed equipment are cabin heater, carburetor air heater, cabin ventilators, engine primer, fire extinguisher, compass, air-speed indicator, standard altimeter, tachometer, oil temperature gauge, oil pressure gauge and landing gear hydraulic pressure gauge.

Specifications and performance data include:

Wing span, 29 feet; wing shord (root), 70 inches; dihedral, 6 degrees; incidence, 2 degrees; airfoil (2313 root; 2309 tip), NACA; overall length, 18 feet 11 inches; overall height, 5 feet 7 inches; hydraulic system Adel; engine, Continental A-80, series 9; propeller, Roby controllable pitch; gross weight, 1,459 pounds; wing loading, 11.22 pounds per square foot; power loading, 18.2 pounds per horsepower.

Wing area including flaps and ailerons, 130 square feet; ailerons, 11.32 square feet; flaps, 10.25 square feet; stabilizer, 11 square feet; elevator tab area, 0.37 square feet; vertical fin area, 3.54 square feet; rudder, 4.37 square feet.

Gross weight performance: Maximum speed at sea level, 138 m.p.h.; cruising speed at sea level, 128 m.p.h.; landing speed with flaps, 47 m.p.h.; landing speed without flaps, 52 m.p.h.; rate of climb at sea level, 700 feet per minute; service ceiling, 14,200 feet; cruising range (20 gallons), 530 miles.

HOW YOUR PLANT CAN JOIN

(Continued from page 68)

in the United States have 100 or fewer employees, and they normally produce about 31 per cent of the manufacturing products.

In order that as much as possible of this capacity be utilized, each plant must take on a maximum of the toughest work it can handle, leaving less difficult operations for those firms which otherwise would not be able to use their facilities.

The problems involved in getting war contracts to smaller and medium-sized establishments are numerous and tough. But they must be solved. Victory depends on it.

Pecos Pete

US TEXANS have remembered the Alamo 'n Goliad 'n San Jacinto fer over 100 years, so yu know we ain't gonna forgit Pearl Harbor.

Home of Mission Manufacturing Co.

The Mission Manufacturing Company

. . . many years a leading manufacturer in the Petroleum Industry, and now working for the

NAVAL BUREAU OF ORDNANCE

Solicits Your Aircraft Work

MISSION

MANUFACTURING CO.

HUMBLE ROAD, HOUSTON, TEXAS

EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK

NORTH CENTRAL TEXAS

Ready for Action

By TONY HAGMANN

WICHITA FALLS, industrial center located twelve miles from the Texas-Oklahoma state line, invites the aircraft industry to consider its resources and facilities for possible location there of new plants or subcontracting awards.

Full co-operation can be obtained from the Wichita Falls Chamber of Commerce and its members if detailed survey material is desired.

A group of firms in the Wichita Falls area pooled its facilities to offer an extensive outlay of machines and labor for war work. While restrictions prevent identifying them, full particulars may be obtained from the Wichita Falls Chamber of Commerce. General figures, however, show the pool's facilities to add up as follows:

Total floor space available, 520,500 square feet; potential machine shop hours per month for defense work, 362,000 man hours; potential maximum numbers of workers for all types of work, 4,686.

Figures representing idle man hours available on specific tools (at the time when data was prepared) are: automatic screw machines, 1,470 hours per month; turret lathes, 9,630 hours per month; engine lathes, 67,200 hours per month; boring mills, 15,840 hours per month; milling machines, 14,280 hours per month; sprocket and gear hobbers, 480 hours per month and punch presses, 20,640 hours per month.

Perhaps the outstanding advantages offered by Wichita Falls are its cheap electricity, natural gas and petroleum products and water. Industrial rates for power and gas are subject to individual contract and compare favorably with those of other cities of the Southwest. The Texas Electric Service Company furnishes the area with power, and natural gas is provided by the United Gas Corporation and the Community Natural Gas Company. Three large lakes furnish the municipal water system.

Wichita Falls is served by four railroads with seven outlets. They are the Fort Worth and Denver City, the Missouri-Kansas-Texas, Wichita Falls and Southern and Wichita Valley railroads. It is on five federal and three state highways. Eighty buses arrive or depart daily—forty in and forty out. Braniff Airways operates convenient schedules into the city.

Kell Field has been improved at a cost of three-quarters of a million dollars and has a class 4-A rating, being equipped with four paved runways and other all-weather facilities. Wichita Falls is the home of Sheppard Field, $18,000,000 mechanics training school with around 30,000 Army Air Force officers and enlisted men stationed there.

At Wichita Falls are two of the South's leading aviation enterprises — the Wichita Falls Air Transport Co., Inc., lessee and operator of the Municipal Airport, and the Wichita Engineering Company, which are fully equipped for government work because of excellent facilities and large quarters.

Worldwide attention was gained in 1938 by soaring activities in the Wichita Falls area. The Chamber of Commerce sponsored a six weeks' expedition of the Soaring Society of America, during which new American distance and altitude records for soaring were established. The expedition maintained in Wichita Falls a Harvard University meteorologist, whose recordings determined the area to be the ideal section of the United States for flying of all types.

Wichita Falls is an oil and gas center and the headquarters of important operations. Over 1,200 individuals or corporations are engaged in the oil producing business in the area, operating 3,600 separate producing leases on which are located 19,400 producing oil wells. Six major pipe line companies operate in the area, gathering the oil and transporting it to distant markets.

Within a radius of fifty miles there are seven refineries, producing large quantities of petroleum products. In these days of shortages in the East and North, Wichita Falls stands as an area of plenty in respects to oil and gas and other utilities.

Wichita Falls is a modern, progressive city with a population of 60,000, 87.25 per cent of whom are native-born white, insuring intelligent, capable labor, free from the radicalism of foreign elements. Living conditions are excellent, due to moderate climate, low rents, cheap fuel, utilities and food.

Taxes are low, with low assessed valuations. There is no state income tax or sales tax. Industrial sites are plentiful.

All these favorable factors make for an ideal location for any type of industry.

WICHITA FALLS . . . . *Reporting for Duty*

The way to victory can be greatly shortened by utilizing every available production facility for the war effort. Production—and *still more* PRODUCTION—is the order of the day.

WICHITA FALLS, Texas, has the industrial resources, the skilled craftsmen, and the *eagerness to serve*, that America needs to help put production over the top. Its many and varied manufacturing concerns *can* make —and stand ready to make—military equipment that our fighting men at the front must have to win the war.

Write today for complete information about Wichita Falls — "Industrial Center of the Southwest."

WICHITA FALLS CHAMBER OF COMMERCE

WICHITA FALLS, TEXAS

SOMEWHERE IN TEXAS

Though April turned out to be the most significant month in the State's aviation history, no fan-fare attended North American's first anniversary, Consolidated's delivery of its first Texas-made B-24, Globe's entry into twin-engine trainer production, Southern Aircraft's expanding operations or Lockheed's modification base enlargement.

THE manufacturing units of Texas' booming aviation industry is hell-bent for leather to whip the Axis with air power. They don't have time for anything outside of production 24 hours around the clock —a fact brought home forcibly last month when there was plenty of occasions for special celebrations.

Texas aircraft factory management and labor don't relish the term "on schedule." Their interpretation of getting the job done is summed up with "ahead of schedule." Anything short of being ahead just doesn't go.

The Texas interpretation of the entire national effort, that of getting more accomplished than is expected of you, shows up admirably in the record chalked up by North American, Consolidated, Southern Aircraft, in Globe's determination to roll out its first trainer far in advance of expectations and in Lockheed's expanding modification plant operations.

Military secrecy and the tightening up on the policy of what can and can't be published regarding war production plants will not permit us to divulge the extent of expansion taking place or the magnificent production records being chalked up by Texas factories. Suffice it to say that Texas is now one of the principal aviation manufacturing states, hard at the job of unlimited production to finish the pleasant duty of rubbing out Hitler, Hirohito & Company. Hundreds of non-aviation concerns within the state are now converting to aviation production. The bright prospects of establishing several additional large plants on Texas soil together with expansion of those now in production, leads us to believe that the Lone Star State bids fair to become one of the major war production centers in the nation. With Texas boasting some 12 per cent of the nation's land area, geographical distribution of production is not only naturally convenient but also right in line with the national program of decentralization. In addition, the Gulf of Mexico is the heaviest and most easily defended body of water surrounding the United States, actually providing protection rather than contributing to vulnerability as do the Atlantic and Pacific oceans.

"SOMEWHERE IN THE SOUTHWEST" THE FIRST B-24 ROLLS OUT

April witnessed the first of a new series of Consolidated B-24 heavy bombers to roll from a new Texas assembly line 100 days ahead of the company's schedule. Tom M. Girdler, Consolidated board chairman, turned the huge bomber over to the Army Air Forces, remarking that his company's aim is to deliver as many as possible of next year's planes this year.

On hand for the occasion was Major General Hubert R. Harmon, commander of the Gulf Coast Air Corps Training Center, who accepted the plant from the corps engineers.

"I say as a representative of some 20,000 air corps cadets in this section," he declared, addressing his remarks to Girdler and the Consolidated employes, "that we regard you as teammates on the greatest combat team in the world. On their behalf I want to say that as you make them we will fly them."

The first B-24 produced in the southwest, capable of more than 300 miles an hour, with a range of over 3,000 miles and a bomb load of over four tons, was given its first flight with George Newman, Consolidated vice-president in charge of the new plant, at the controls.

The two oldest aviation plants in Texas are North American and Southern Aircraft. When North American Aviation's first anniversary in Texas rolled around last month on April 7, no one paid much attention to it. Aside from a congratulatory telegram from President J. H. Kindelberger, the only indication around the plant was more effort and more production on the part of the employes. Replacing the speeches and brass bands of a year ago was the sound of rivet guns, drills and drop hammers in the factory and sparkling new airplanes warming up on the ramp. In a year the watchword throughout the plant has become: "Keep 'em flying by getting 'em built!"

Southern Aircraft, after several expansions last year, settled down to streamlined production methods on its tremendous orders from the industry all over the nation for specialized parts and assemblies. Southern dropped its plans to manufacture their BM-10 trainer and came to the rescue of several large prime contractors even before the automobile industry was on the way to conversion for aircraft building. Southern's job in Texas has been one of the most outstanding in the industry, though little has been spoken or printed about their contribution to war production. They have yet to turn out an order at the time specified—*it's always been weeks and in many cases months ahead of scheduled dates.*

Heading up Southern Aircraft is Willis C. Brown, veteran airplane designer and pilot. B. R. Sherrell is production manager, L. D. Barnhill is purchasing agent and Frances Brown is personnel manager.

The Globe Aircraft Corporation, founded in 1940 to develop the Bennett twin-engine transport, which received its approved type certificate the previous year, recently blossomed into full manhood by virtue of a contract award to build Beechcraft twin-engine advanced trainers. Ninety-five per cent of the design will be subcontracted. The Defense Plant Corporation has allotted funds to be used in building a full size factory. John Kennedy, who is well known in southwestern financial and stock circles, is president of Globe, having held that position since the founding of the company. E. J. Rivers, formerly factory manager with North American Aviation, Inc., of Texas, is works manager. Bruce Sullivan is outside production manager and R. R. Young is personnel manager. Other officials include C. D. Reimers and William Viner, vice presidents; George P. Hill, treasurer; and Edwin H. Jackson, secretary. Prior to receipt of the large war department contract, Globe received an A.T.C. on its two-place, low-wing Continental powered "Swift," announcement of which is made elsewhere in this issue.

Texas' youngest factories are those of Consolidated and Lockheed, both just now getting under way. Whereas Lockheed's plant, under the direction of Don Marshall, will modify certain types of aircraft being built at the main Lockheed plant in California, Consolidated is building complete airplanes of the B-24 type. Consolidated's first Texas-built bomber was completed last month and turned over to the Army Air Forces.

George J. Newman, veteran Consolidated executive, is vice president in charge of operations at the Texas plant. Division manager of the plant is Archibald M. Hall, also a Consolidated veteran and former president of the Hall-Aluminum Aircraft Corporation. Other Hall-Aluminum officials who went to San Diego when Consolidated bought out the company and since have been transferred to the Texas factory are: Henry Deichert, assistant to the manager; Charles F. Paper, assistant treasurer; Sam Rank, production manager; E. J. Tynan, purchasing agent; and John H. Smith, chief of tool design.

TEXAS INGENUITY

Another tangible evidence of the constant striving of the Texas aircraft industry both by workmen and supervisory personnel to speed up the vital war of production is this assembly line for rudders at the factory of North American Aviation, Inc. This new "miniature" assembly line, patterned somewhat after the final assembly line for the entire airplane, was planned and built by the men in the department under the supervision of their foreman. It is estimated to have cut the assembly time on rudders by at least 30 per cent. The apparatus, built of scrap metal with the aid of the tool-making department, was frankly an experiment. It has proved so successful, however, that the new technique will be used for all rudder assembly. In the background can be seen the benches on which, heretofore, the rudders were assembled. The rudders are mounted on a cradle-like support, which can be moved along the metal track on rollers. As each pair of men finish their particular job on the rudder, it is rolled along the track to the next pair of workers.

DPC Approves Huge Loan For Blast Furnace in East Texas

Marking the first definite step toward the development of the tremendous iron ore deposits of East Texas, the Defense Plant Corporation has approved a loan of $14,850,000 to the Southwestern Steel Company of Texas for establishment of a blast furnace and all facilities for its operation, to be located near Daingerfield and Hughes Springs in Morris and Cass Counties.

Pending before the Defense Plant Corporation is an application for a loan of $3,041,299 for a second plant to be located at Rusk in Cherokee County to the Christopher Iron & Chemical Corporation. The process differs from that to be used at Daingerfield-Hughes Springs in that the Rusk furnace, if it is built, will be a charcoal reduction plant.

A group of Texans backing the Daingerfield-Hughes Springs project headed by John W. Carpenter, president of the Texas Power & Light Company, has agreed to supply a working capital of one million dollars for the plant in order to qualify for the sum to be allocated by the Federal Government.

Plans for the Daingerfield-Hughes Springs project include the construction of a 1,200-ton blast furnace, sixty modern coke ovens, water supply system with a large reservoir, coal mining lands, iron ore mining equipment and power plant. The plant structures will cover an area one mile long by one-half mile wide.

The company has acquired enough iron ore land within from six to ten miles of the blast furnace site to keep the plant in operation for fifty years or longer. The grade of ore is richer than that obtained from the Lake Superior district or from Birmingham, Ala. The company has acquired several thousand acres of coal land in Oklahoma and will operate its own mines.

The blast furnace will employ approximately 600 men in addition to several thousand workers engaged in mining and transporting the ore to the plant.

Plans of the company embrace also the establishment of a $15,000,000 steel plant to be operated in conjunction with the blast furnace with open hearth furnaces and rolling mills. Plans for this project are incomplete.

Texas Number Two State in Ports, Planes, Fliers

Texas is second among all the states of the Union in the number of its airports, pilots and planes. It is estimated that air passenger traffic includes 400,000 Texans annually.

The seven airlines serving Texas support approximately 1,500 families whose total annual expenditures are estimated at $3,000,000.

Route miles flown daily rose from 9,068 to 23,500 miles in the 1931-1941 decade. The latest report showed this total was made up by the various lines as follows:

Braniff, 9,820; American, 7,530; Eastern, 2,950; T.W.A., 1,600; Delta, 1,200; and Chicago and Southern, 400.

The seventh airline that serves the state, Continental, comes into El Paso, but records no route miles for Texas because it flies only from the neighboring New Mexico border.

New Policy of RFC Helps Small Firms

The Reconstruction Finance Corporation's new streamlined policy of approving loans up to $100,000 without submission to Washington is materially speeding up participation of small business in the war effort, according to C. B. Glidden, manager of the RFC Dallas Loan Agency.

Glidden said the first forty-five days of the program had resulted nationally in 578 loans totaling $18,291,656.54.

Practically all cases were for direct or indirect participation in the war effort. They were granted, he said, with complete elimination of red tape and almost no delay.

Typical, he said, was this case:

"On April 20 a local manufacturer of airplane parts contacted the Dallas agency. He had only about $10,000 of used equipment, plus the ability to manufacture these parts without delay and in the manner desired by some of the largest airplane factories in the country.

"That was all he needed. On April 22 a loan was approved in the amount of $100,000, $40,000 of which was for the purchase of new machinery and $60,000 for operating funds necessary to complete a $70,000 order which

Serving Aviation in Texas ★ ★ ★ ★

Complete Line of Machine Tool
Equipment for the Aviation Industry

HAMILTON-HUSTER MACHINERY COMPANY
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Let's Go, Texas! Keep 'Em Flying!

HAGGAR & CO., Dallas, Texas

★ MACHINE TOOLS
★ ELECTRIC HAND TOOLS
★ CLEVELAND TWIST DRILLS
★ SIMONDS SAWS AND FILES
★ STARRET PRECISION TOOLS
★ BLACK HAWK WRENCHES
★ MACHINE SHOP EQUIPMENT
★

Tools - Equipment - Supplies

FOR THE AIRCRAFT INDUSTRY

Among the many advantages which aircraft manufacturers find in Texas is a dependable source of tools, machines, equipment and supplies, available through such aggressive distributors as Well Machinery & Supply Company.

One of the largest stocks of aircraft and industrial supplies in the entire South is here for your needs. The lines we offer include such famous names as *Starret, Black Hawk, Simonds, Cleveland, Black & Decker* and many others.

Write, wire or phone for quotations on your requirements.

Well Machinery & Supply Co.
1629 Main Street Fort Worth, Texas

was promptly given him upon the airplane factories being assured that he could obtain RFC assistance.

"Such loans are being made in Dallas every day and will continue to be made as long as RFC funds are necessary to assist business in this territory, little or big, do their full share in winning the war."

Texans First in Air War

Texans have out numbered pilots from any other state in citations for air exploits on record with the War Department as of April 25. They have received twelve Distinguished Flying Crosses, three Distinguished Service Crosses and four Silver Stars.

Leading the vanguard of the valiant has been Captain Hewitt Wheless of Menard, who received President Roosevelt's personal citation. He brought home a crippled B-17 after succeeding in a bombardment mission in the Philippines and his crew shot down eleven of eighteen Jap fighters which fought the Flying Fortress in a 75-mile running attack. He received the Distinguished Service Cross for his exploit.

We join all Texas in saluting
the industry of today and tomorrow —
AVIATION
and cordially invite all branches
of this dominant force
for victory to make their homes in the
Lone Star State

VOLK
WOMEN'S APPAREL and ACCESSORIES
SHOES for MEN, WOMEN and CHILDREN
DALLAS and HIGHLAND PARK

GO!
TO THE
TEXAS STATE HOTEL
WHEN YOU'RE IN
HOUSTON
• COMPLETELY AIR CONDITIONED.
• SPECIAL RATES FOR PERMANENT GUESTS.
• PRIVATE ROOMS AVAILABLE FOR BANQUETS, PARTIES, AND BUSINESS, CLUB OR SOCIAL MEETINGS.

Completely
Air Conditioned

Stop at the TEXAS STATE. Enjoy the large comfortable rooms . . . the tasty meals in the Famous Silver Grill . . . the restful quiet of its air conditioned atmosphere.

Take a tip from experienced travelers and make the TEXAS STATE a Houston "Habit" of yours.

B. F. ORR, Manager **Fannin at Rusk**

TEXAS STATE HOTEL
HOUSTON

"You Can Reach Me at The Melrose Hotel"

★ With airline personnel in Dallas, that's a familiar greeting from passengers who fly into Love Field from everywhere.

★ The Melrose is a popular address for business men and air travelers alike—located conveniently between the airport and downtown.

THE MELROSE HOTEL

JOHN E. WILLIAMS, *Manager*

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RONALD REAGAN
Star of "KING'S ROW"
A Warner Bros. Picture
Wearing a Resistol "Santa Anita"

A SALUTE to the ever increasing thousands of men training and producing for aviation in Dallas—they know when it comes to hats, the RESISTOL, with its wide, smartly bound edge can't be beat.

Jas. K. Wilson
Main at Field
DALLAS

ECLIPSE

JARDUR
Bezelmeter Aviation Chronographs
and Precision Aviation Accessories

SHELL

LET'S GO! U.S.A. KEEP 'EM FLYING!

Scarab
WARNER AIRCRAFT CORP.

SPERRY

THE AIRCRAFT INDUSTRY

Is On the March!

BIG

HAMILTON STANDARD PROPELLERS

Gone are the days when a few big cities claimed the aircraft industry. Mid-America is coming into its own, with huge aircraft plants in full operation and thousands of manufacturers, large and small, who have never made anything more warlike than a branding iron, now eager to share in the vital task of unlimited war production.

LYCOMING Engines

TEXACO

We welcome this new aviation blood, knowing full well that "WHAT TEXAS AND MID-AMERICA MAKE" can *make* the difference between an early victory and a prolonged war.

HUMBLE

MAGNAFLUX

BENDIX SCINTILLA

CAMBRIDGE INSTRUMENT CO INC

VEGA

SOUTHWEST AIRMOTIVE COMPANY

RANGER AIRCRAFT ENGINES

menasco

Stromberg CARBURETORS

Pioneer

WRIGHT AIRCRAFT ENGINES

PRATT & WHITNEY U.S.A. DEPENDABLE ENGINES

LOVE FIELD DALLAS, TEXAS

"Airline Maintenance for the Private Owner"

FREEDMAN-BURNHAM ENGINEERING CORP.
ADJUSTABLE PITCH PROPELLERS

LOCKHEED

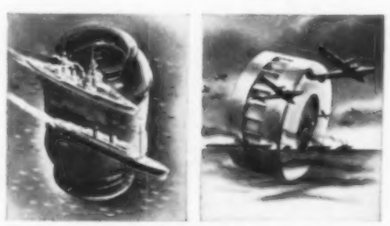
PESCO
PUMPS AND ACCESSORIES

Ears that hear miles into the sky

SENTRIES of the night must glean even the faintest murmur of an airplane in the skies. From this sound, the location and direction of flight must be determined, searchlights pointed, the plane identified, and, if necessary, intercepted.

To do this, the sensitivity of the human ear is magnified and made keenly aware of direction by the huge mechanical ears of the Sperry Sound Locator.

This instrument is but one of the many units manufactured by Sperry to increase the efficiency and effectiveness of the armed forces.



Among Sperry products playing a vital role in the war effort are the Gyro-Compass, Gyro-pilot, Directional Gyro and Gyro-Horizon.

SPERRY GYROSCOPE COMPANY, INC.

BROOKLYN, NEW YORK